TECHNOLOGY DEP

Gas Journal

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DETROIT

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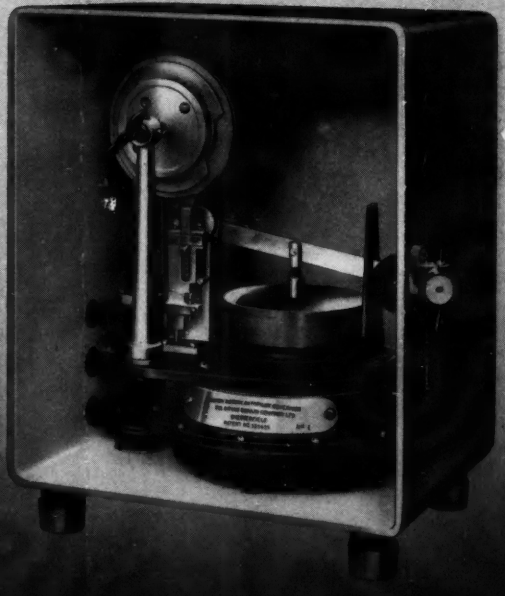

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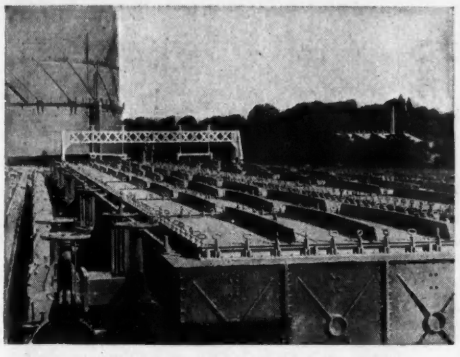
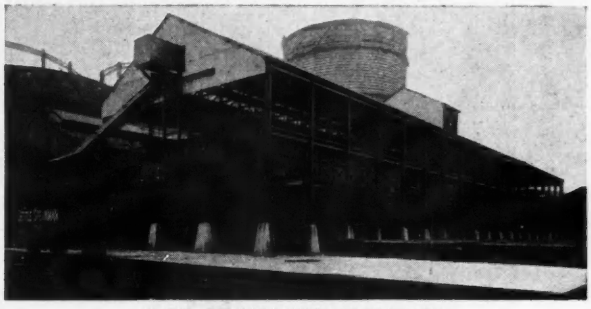


A GROUND LEVEL INSTALLATION OF DRY BOXES



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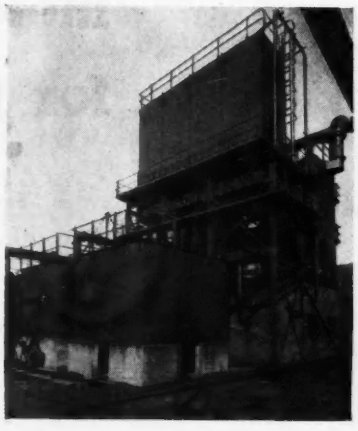

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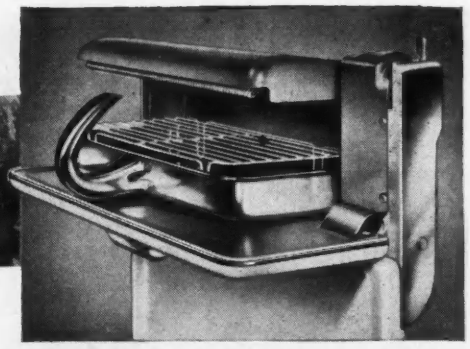

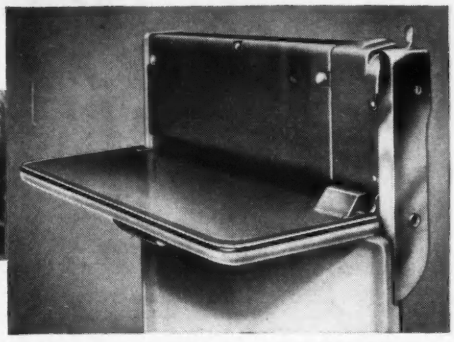

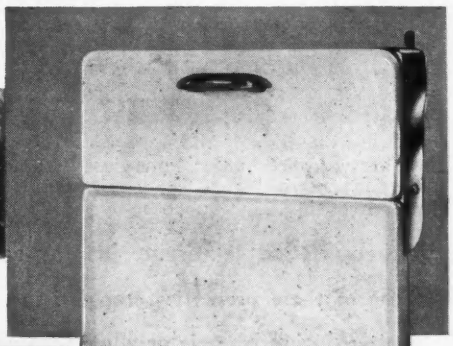

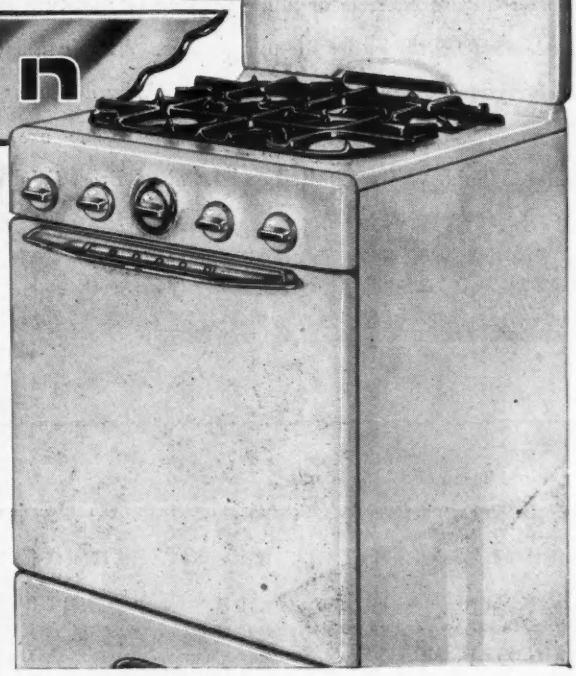

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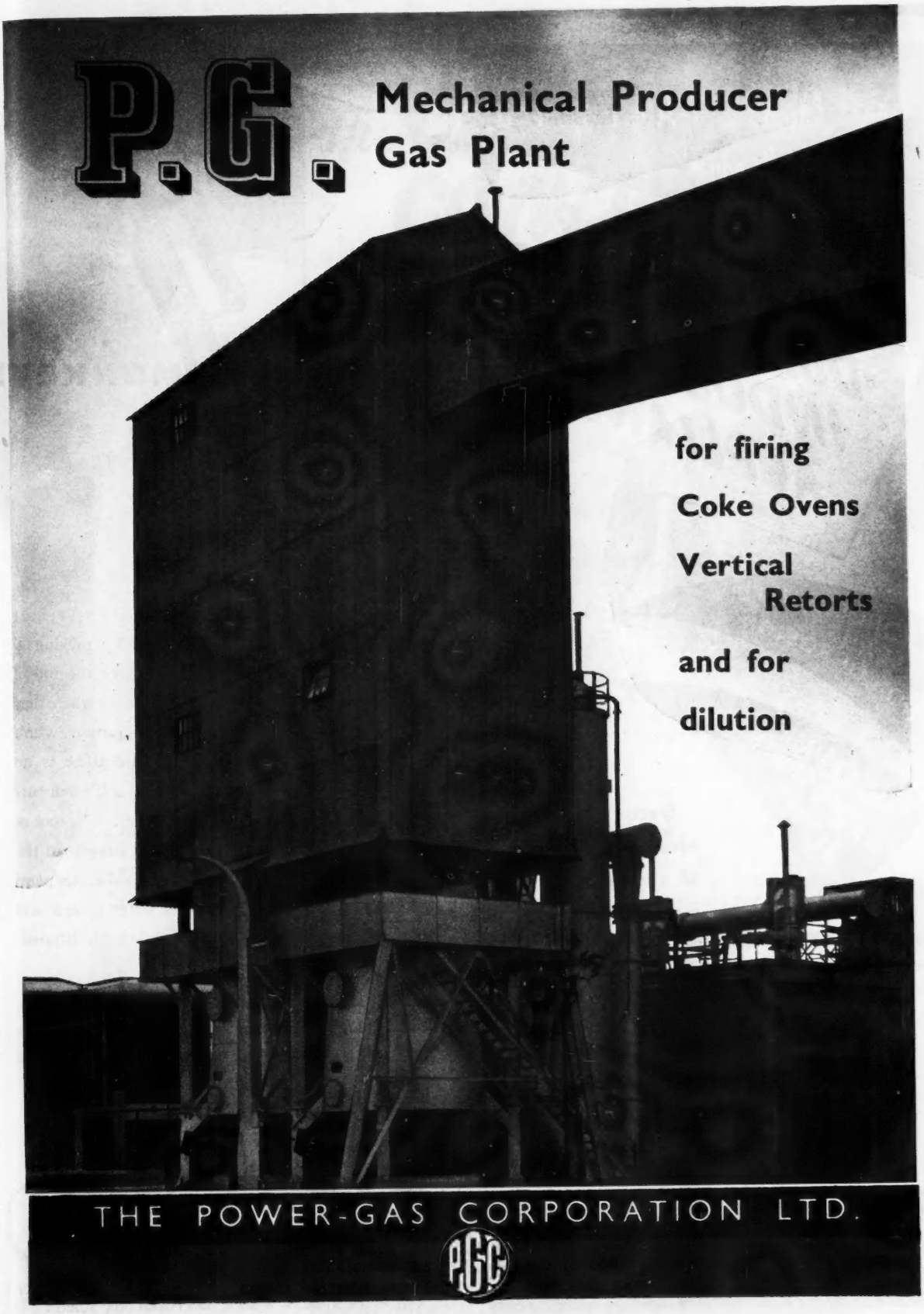

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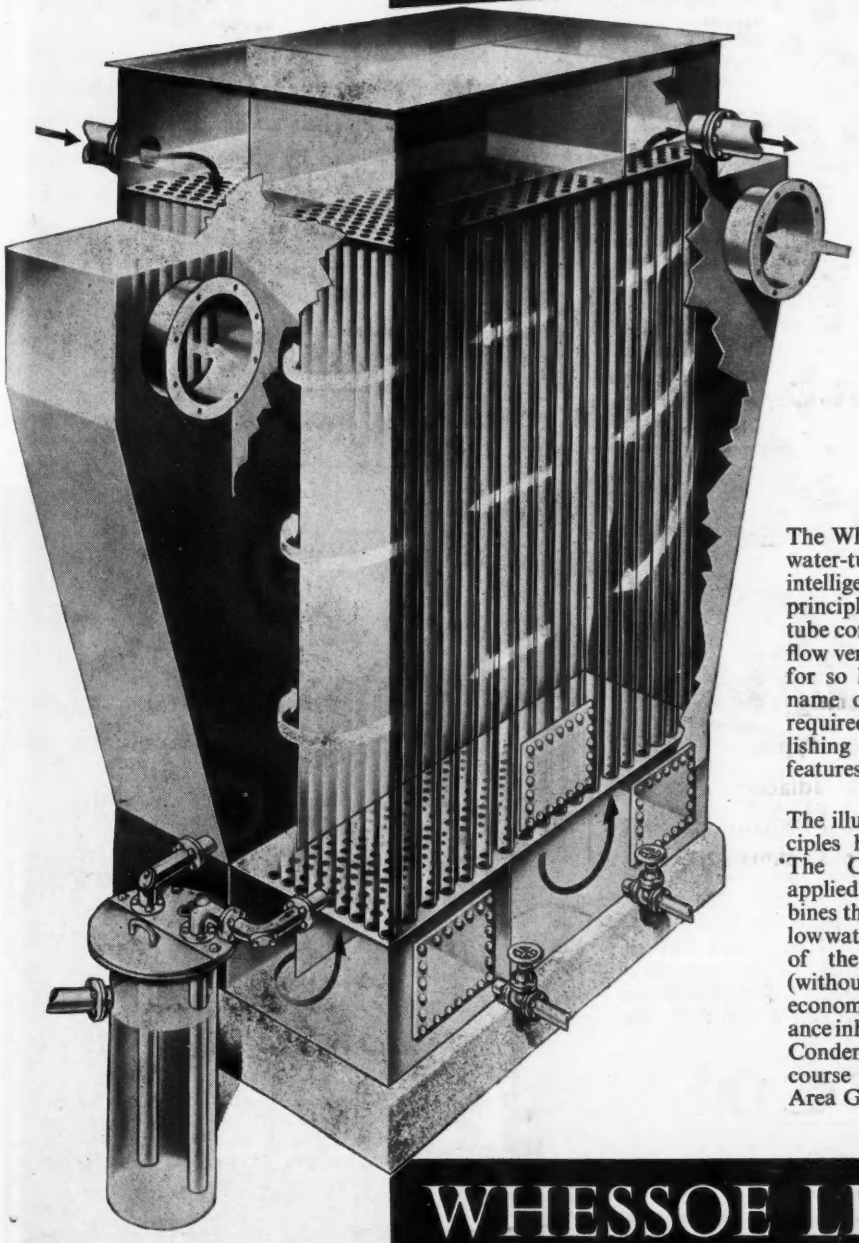

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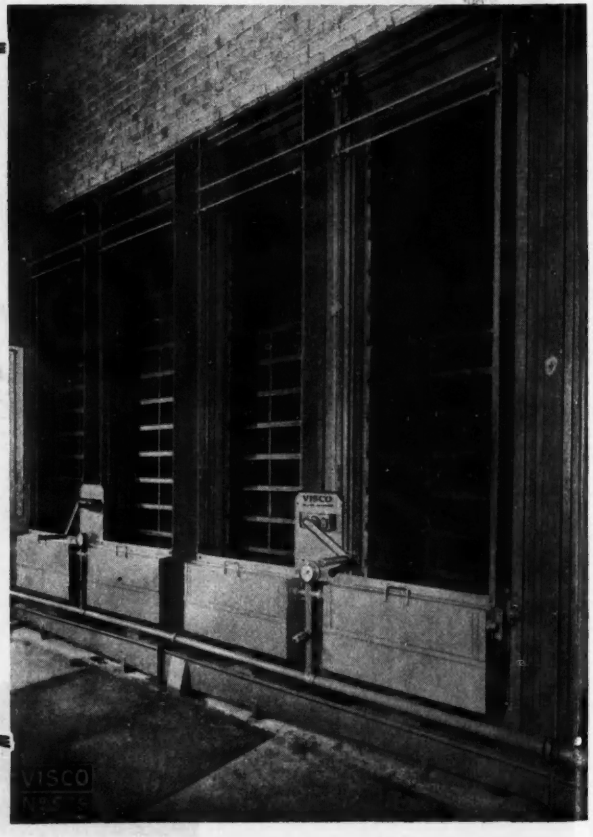

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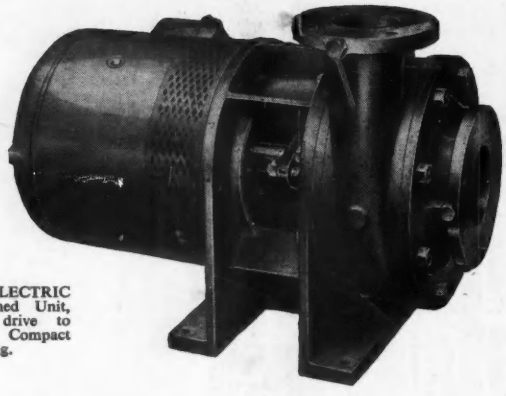

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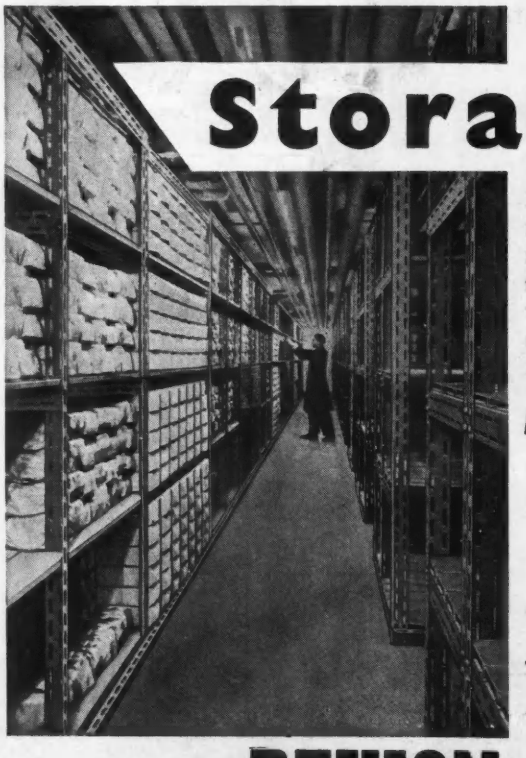

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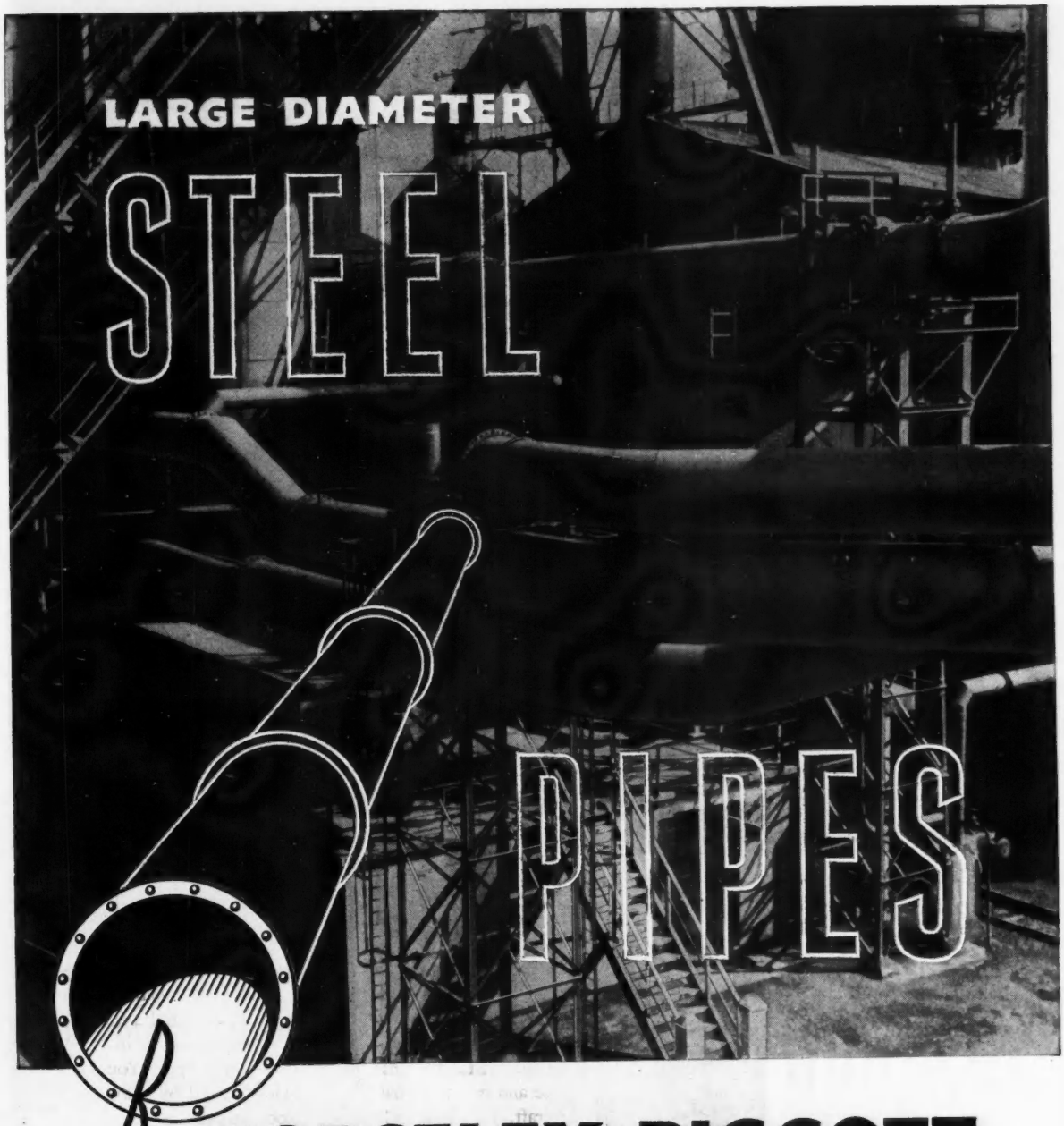

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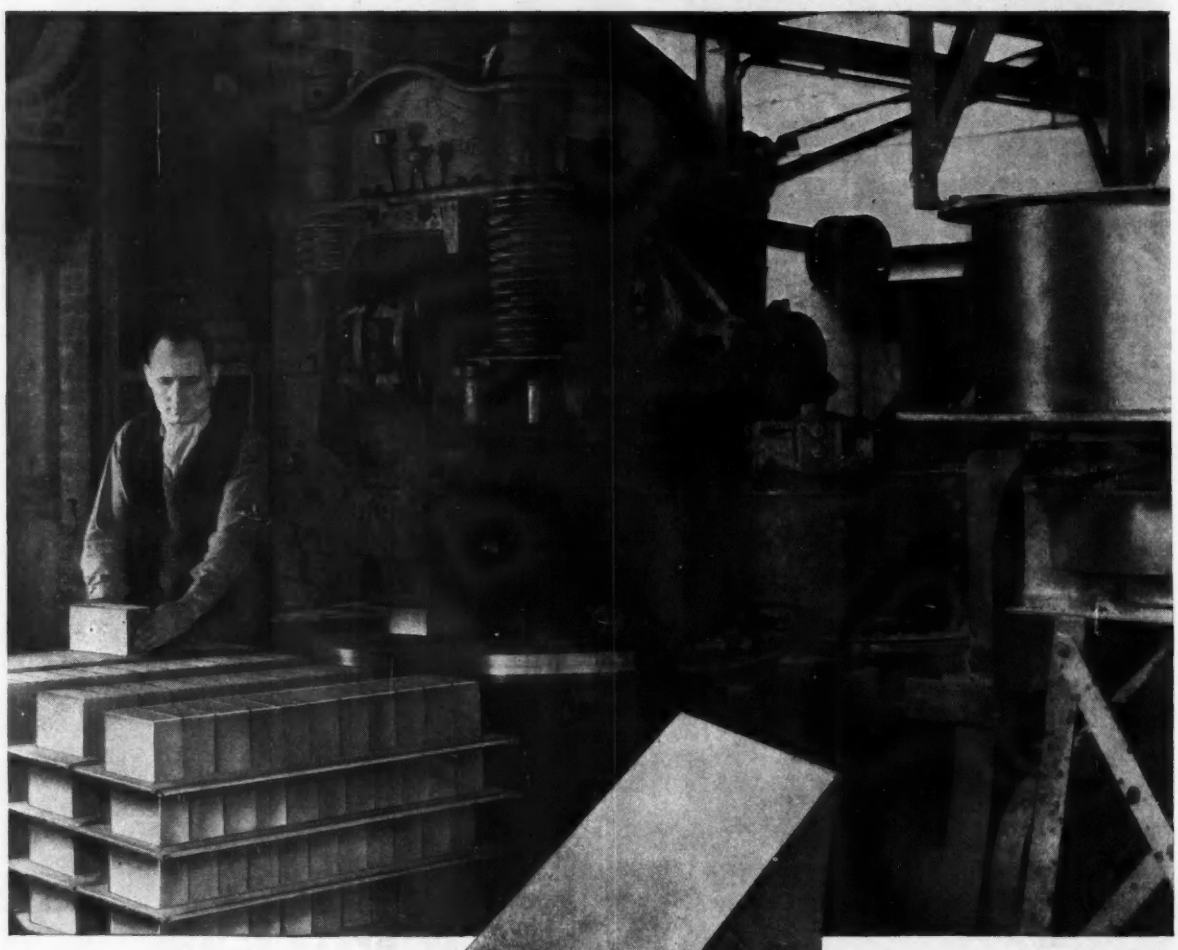

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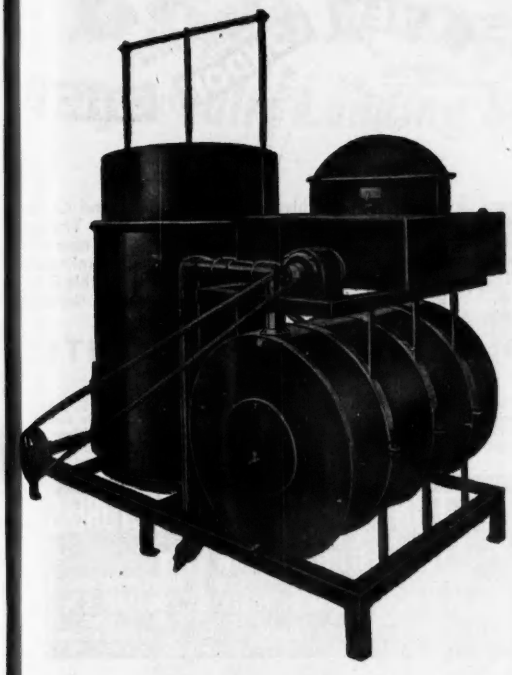

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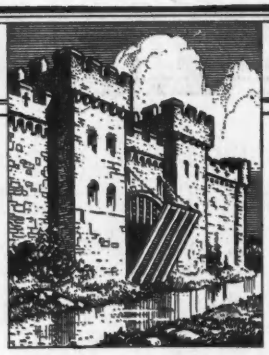

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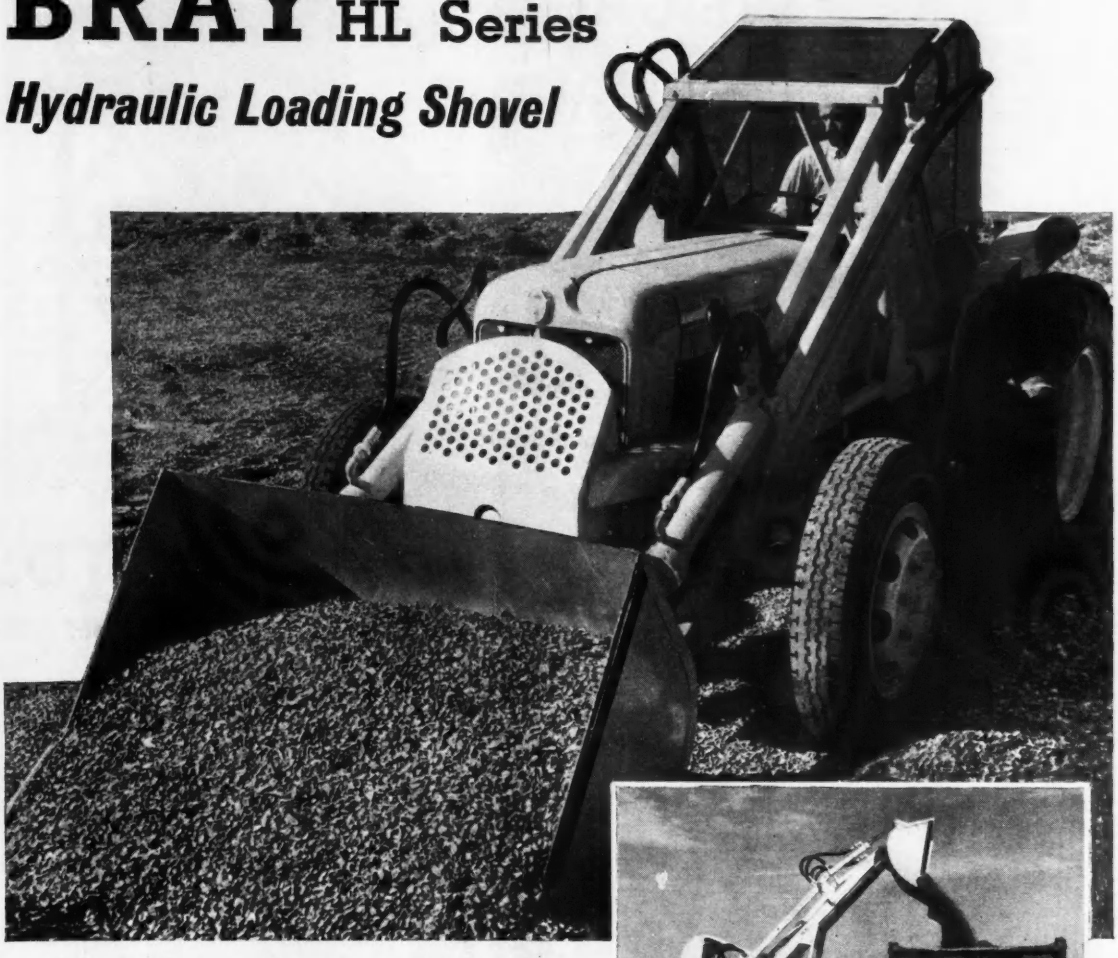

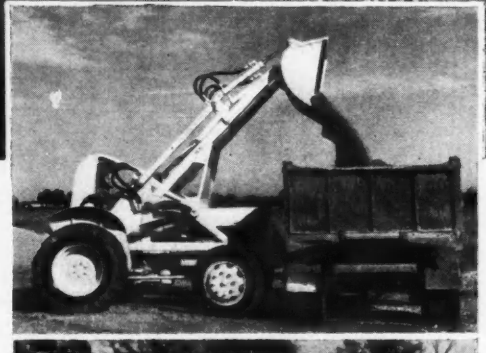

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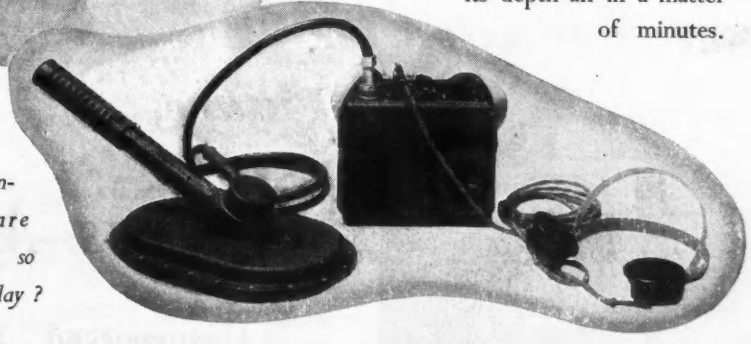

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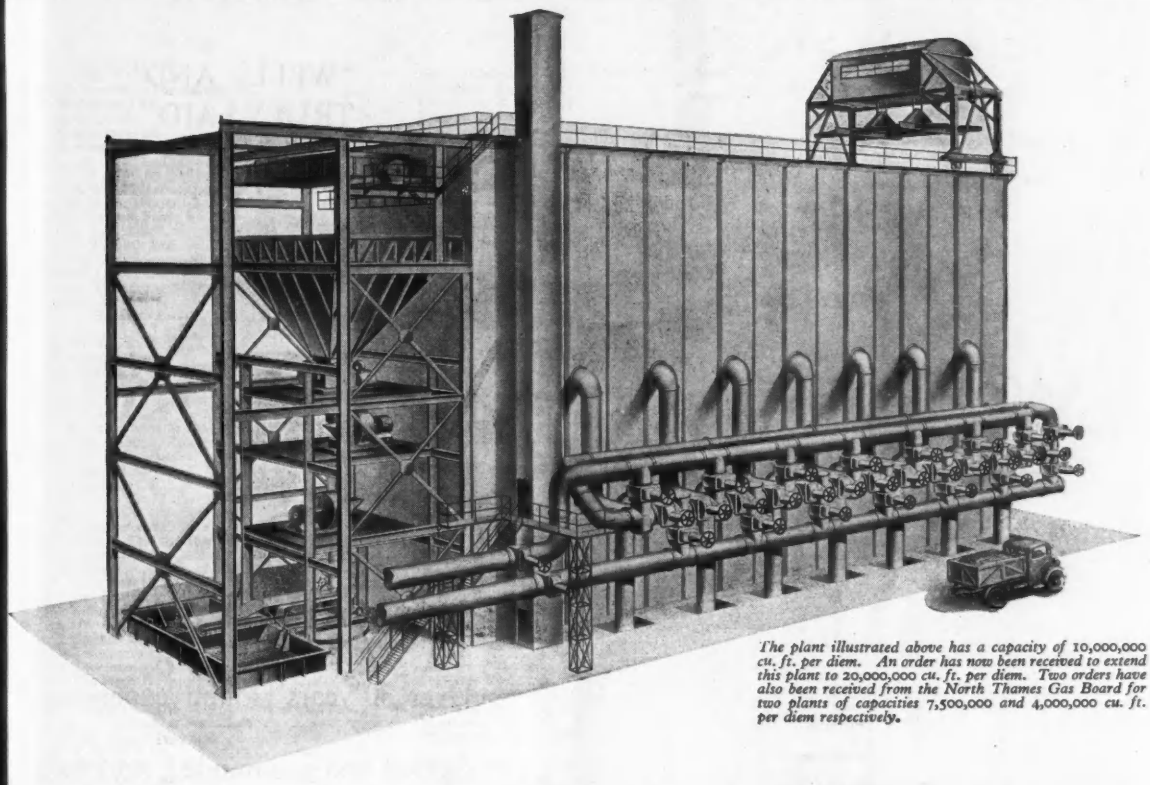

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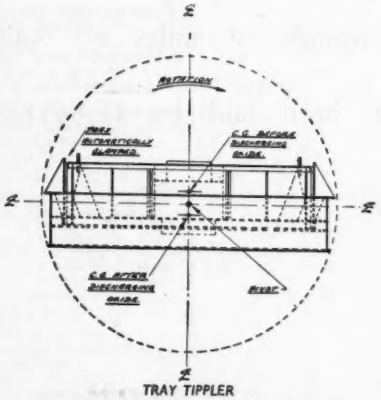

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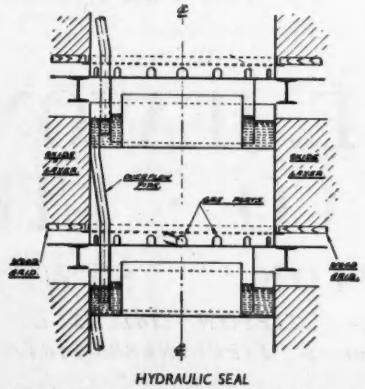

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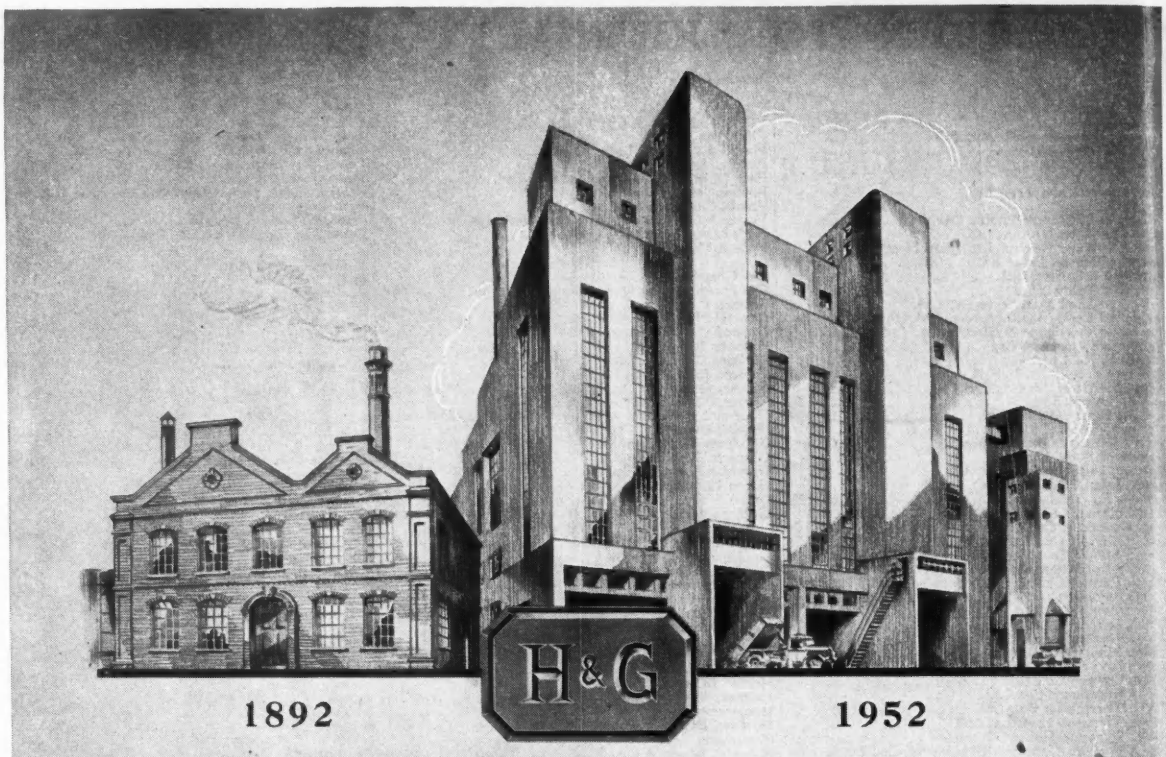

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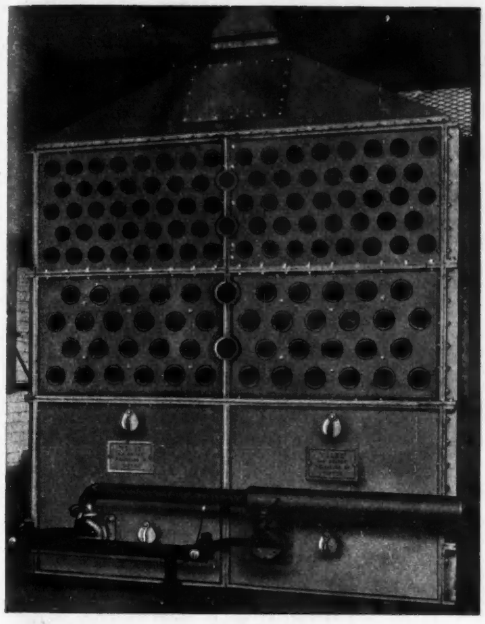

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GAS JOURNAL

VOL. 271. NO. 4649 104TH YEAR JULY 9, 1952

CHEMICAL PURIFICATION

THE Institution Meeting of 1952 will be memorable for more than one of its features, not the least of which is the thorough-going discussion of the methods and apparatus for the removal of hydrogen sulphide from crude gas, methods and apparatus now in use and those adumbrated for future development. Perhaps the discussion of the tower purifier was a little too intensive for a June meeting, but it did underline in no uncertain way the fact that this is not the universal panacea. It would appear to be impossible to secure even contact between a gas and a static mass of solid material. Mr. Hawthorn's comparison of the single tower with the single box showed that the attempt to equalise 28 parallel streams did not make it any easier. The fact seems to be that the tower presents a solution of the mechanical handling problem, a substantial amelioration of labour conditions, but that it has its own problems in the maintenance of the correct physical and chemical conditions within itself. Very many oxide boxes will be with us for a long time and improvements in their working will have to follow the pattern of detailed study indicated in this discussion.

A more fascinating vista is opened up by Dr. Hollings' picture of the developments in new purification processes which are being examined at the present time. The design of new forms of purifier apparatus, dynamic or vertical, using solid materials, is wrapped up with the discovery of new and more active material of definite composition. As so often happens in technological progress the scarcity of a conventional material leads to the searching out and discovery of a new one. Is it possible that copperas is to replace bog ore or shall we see apparatus operating at such high velocities that the preparation artificially of a highly active granular form of iron oxide may be economically justified? The vertical purifier shown in Dr. Hollings' paper is somewhat more complicated than that which we saw at Bournemouth in 1950 and of which, curiously, nothing was said this year. The horizontal purifier with its promise of ease of manipulation and material handling and the new designs of tray and of tower purifiers, all now being studied and developed by the North Thames Gas Board, are further instances of enterprise and technological advance for which the industry as a whole is so often indebted to this great region. New and more expensive purifying material will clearly demand greater care in regeneration and in the recovery of sulphur, which besides will be justified by our present shortage of that element. Pilot plant with toluene as a solvent is already working producing sulphur with only 0.1% of impurity.

But the interesting announcement was that the North Thames Board has decided to try out one of the systems of liquid purification. The principle of liquid purification has many points in its favour, among them the possibility of producing elemental sulphur direct while, it has been suggested, if the time comes for the catalytic removal of organic sulphur compounds from gas it may be easier to introduce that into a liquid purification line than into the line of a dry system. The system adopted is the well-known Seaboard sodium carbonate process as used by the Koppers Company in America and adopted and developed by the Woodall-Duckham Company. The W-D Koppers vacuum carbonate system, described as an absorption and desorption process employing a solution of sodium carbonate as the washing medium, is to be installed at Beckton in a plant of 13 mill. cu.ft. daily capacity and it is expected to remove 90% of the hydrogen sulphide and 85% of the hydrogen cyanide content—the residue of the hydrogen sulphide will be removed in conventional oxide boxes. In this plant, which was pretty fully described in the paper, the sulphur is to be recovered in the form of sulphuric acid, but Dr. Hollings suggests that in any future liquid purification scheme there is a possibility that the Claus kiln may be revived to recover elemental sulphur—the storage and disposal of which may be easier than that of acid.

It may be, then, that purifiers of the future will be either some form of fully mechanised dynamic, vertical, purifier using by-product copperas or other artificial oxide of uniform quality, or some system of liquid

purification, and that it would appear that the two may have to be used together for as long as one can see. The problems of the immediate future are set out in Dr. Hollings' conclusion, which is a model of concise statement. We seek a solid purifying material of definite composition, highly reactive to sulphur compounds, capable of easy flow in and out of the purifying chambers or continuous flow under gravity, with the alternative of a liquid, continuous process the incompleteness of which might be balanced by its perfection of even contact and supplemented by a final dry process of small dimensions and cost.

HARLOW NEW TOWN

THERE is healthy rivalry among the new towns. Fourteen months ago we reported that development at Crawley was more advanced than in any other scheme. A few weeks ago Hemel Hempstead boasted of the completion of its 1,000th house. Elsewhere in this issue we publish some facts about Harlow New Town, Essex, where the Eastern Gas Board expects ultimately to sell 3 mill. cu.ft. of gas per day. Although it adjoins the old village of Harlow, the New Town is new in fact as well as in name, and plans to house 80,000 instead of 60,000 people are reported to be making rapid progress. Building is now proceeding at the rate of 1,000 dwellings a year and the aim is to form an entirely new community. Its inhabitants, drawn from congested areas of north and north-east London, will have opportunity to develop their community life and form their own traditions during the 10 to 15 years which must elapse before the completion of this bold experiment. Gas, electricity, water, and drainage are all being installed as road construction proceeds. The New Town is not to be a London dormitory. A variety of occupations will be open to its residents, with industries balanced to ensure steady employment and security. Those who go there to work will be sure of a home; those who go there to live will be sure of a job.

As in the case of Crawley, gas appears to be getting a square deal both in the domestic field and in the industrial and shopping centre developments. Experience to date has shown that 74% of the tenants have chosen gas for cooking. With the exception of a few flats, interior heating is by gas-ignited smokeless fuel grates which also heat the water, while tenants have a free choice of gas or electricity for cooking and other domestic services. A gas wash boiler supplied by the Development Corporation is standard in every dwelling unless the tenant already possesses one or prefers to purchase another type of his own choice. Kitchens have concealed gas and water supplies to a prefabricated fitting for a sink water heater, and points are provided for gas refrigerators and, in houses with large halls, for gas radiators and space heaters. The gas equipment for the industrial estate is similar to that at Crawley.

All the new towns, and particularly Harlow, which is a long way from the nearest adequate production centre, present special long-term problems involving works and plant adequate to meet requirements when the new towns are fully developed, which means that mains now being laid are considerably larger than the immediate demands require. The Eastern Gas Board, with four new towns in its Watford Division and one—Harlow—in its Tottenham division is, as Mr. T. C. Battersby pointed out during the discussion on Mr. W. A. Evetts's Institution paper, carrying a burden which must have an adverse effect on its finances for many years. Of the £115,315 spent by the Board on trunk and estate mains to the five new towns up to the end of March, 1951, £83,265 had been incurred in respect of Harlow, and the second annual report published last December budgeted for an expenditure of £87,000 on a new 1 mill. cu.ft. holder for the Harlow New Town. A high pressure trunk main from Hoddesdon to Harlow, comprising nearly seven miles of 12 in. pipes, was completed in December, 1950, at a cost of £55,100. Before the new town was linked with Ponders End its gas supply came from Bishop's Stortford works, which has a capacity of a little over 1 mill. cu.ft. per day and therefore could not hope to cope with the demands of the new town. The revenue from the small quantity of gas sold in Harlow New Town last year was not sufficient to cover interest and depreciation on capital. During the period when a new town is being developed it is estimated that the cost of interest and depreciation will vary from 7.57d. to 4.24d. per therm, compared with 2.39d. per therm in respect of all capital works and plant for the latest complete year. The second annual report of the Gas Council recognised that 'the boards are confronted here with a serious financial problem, which is seen in its worst form in the Eastern area.' The Board's own annual report suggested that an interest-free loan or a contribution under Section 2 of the New Towns Act, 1946, would ease the burden considerably.

GAS COUNCIL RESEARCH

ON Thursday last the Research Committee of the Gas Council entertained at a 'farewell' dinner the senior staff of the Gas Research Board, which body, as recorded in our issue last week, formally expired on June 26. 'Expiry,' however, is definitely a misnomer, for the energies of its members have for the most part been transferred to the Gas Council, and at the dinner on July 3 further assurance was given by Colonel H. C. Smith, Chairman of the Council, that the welfare of the former G.R.B. staff would be fully safeguarded. Colonel Smith impressed on those present that the new structure of gas industry research was well and truly founded, with the great promise of co-operation from all sections of the industry and the benefit of a new outlook from eminent scientists. We ourselves think that high hopes are justified and that the sterling endeavours of Dr. J. G. King, Sir Ernest Smith, Dr. E. V. Evans, and Dr. H. Hollings have indeed laid foundation for fertility of imagination and, with the new structure, greater possibilities of the speedier application of research to gas manufacture and supply practice. At the dinner tribute was fittingly paid to those who had helped to create these possibilities, and good wishes were extended, to which we would add our own, to Dr. F. J. Dent and his staff at the Birmingham Centre and to Dr. R. H. Griffith and his staff in London.

PRESS RECEPTION

SMOKELESS zones make news—indeed, they are providing the National Smoke Abatement Society with some of the best publicity that earnest body has ever received. The summer issue of *Smokeless Air*, the Society's excellent magazine, devotes an article to the reception given to Manchester's 109 smokeless acres by the Press. The zone, which includes much of the central area, became smokeless on May 1, when Section 35 of the Manchester Corporation Act came into force. Now it can look clear to the heavens, its air unpolluted by the products of the 2,128 open fires, all but 12 burning bituminous coal, which formerly operated there. It is fortunate that, through the newspapers, this little revolution has captured public interest, because only through the weight of public opinion can the Society's aims reach fruition. The way the various Manchester papers tackled the subject is not without interest: The *Manchester Guardian*, calmly factual; the *Manchester City News*, hysterically exultant; the *Sunday Chronicle*, mildly fanciful. It was the last-named paper which, referring to the way life went on as usual in the Coal Board offices, added: 'Officials continued to sell coal to their customers sublime in the knowledge that their own offices were centrally heated by gas-fired boilers.' The other papers, too, lent their support. But it was the *Guardian* and the *Evening News* which really got to the root of the matter. 'A smokeless central area is valuable only as a point of departure,' said the *Guardian*, and the *News* agreed that a single zone was not enough, although a start had to be made somewhere. Manchester is our second smokeless zone, the first being at Coventry. Perhaps some more N.S.A.S. dreams will come true in the not too distant future. Meanwhile, we commend the Society's idea for a smokeless Coronation, a suggestion based on the fact that when Queen Victoria and the Prince Consort visited Birmingham in 1858 to open the Aston Hall, a resolution was made that no fire should be lighted throughout the day.

IMPROVED COAL STOCKS

NOTWITHSTANDING an increase of 77,000 tons in its coal consumption during the first 25 weeks of 1952, the gas industry is in a substantially better coal stock position than it was 12 months ago. Ministry of Fuel and Power statistics published last Wednesday showed that on June 21 distributed stocks at gasworks totalled 2,784,000 tons, enough to keep the industry going for 4.3 winter weeks, compared with 2,013,000 tons, or only 3.2 winter weeks' requirements, a year ago. Corresponding improvement is shown for all the public utilities, coke ovens, industry, house coal, and miscellaneous, merchants' stocks of house coal having risen from 485,000 tons in June, 1951, to 757,000 tons on June 21 of this year. The saleable output of deep-mined and opencast coal in the first half of the year was 1.54 mill. tons more than in the first half of 1951 (114,400,000 tons against 112,855,000) when the rise over 1950 was 2.62 mill. tons. The latest figures represent 58% of the Government's production objective for the year. Total output in 1951 was 222.12 mill. tons. Output per manshift has fallen below the 1951 level—1.2 tons against 1.21 tons overall, and the manpower average is 10,800 greater than in 1951. On June 21 there were 718,100 men on the colliery books, against 701,700 in 1951. The output target for 1952 is 213.5 mill. tons; if the present rate is maintained during the next six months this figure will be exceeded by nearly 4 mill. tons, but output is likely to be reduced by holidays. Coal imports for the first half of the year were 318,000 tons against 1,131,300 for the first half of 1951. Exports at 5.08 mill. tons were 1.95 mill. tons greater than a year ago. In its annual report issued last week the National Union of Mineworkers' executive stated that the Union would not be satisfied until the industry is able to export larger quantities of coal. This, said the report, is necessary to help Britain's trading position and because in the near future British overseas markets will be threatened by competition among European coal-producing countries.

RECORD OF ACHIEVEMENT

THE annual report, for 1951, of the American Gas Association, just received, is once again a record of achievement. It is the story of an industry in action, and inasmuch as the A.G.A. has no precise parallel in this country the report makes all the more interesting reading, indicative as it is of new peaks of service by American gas utilities to more than 25 mill. customers. The A.G.A. believes in action by committee; during the year under review 257 committees, made up of 2,271 members, worked on industry problems at every level of operation. One such committee, for instance, is studying the engineering and economic aspects of underground storage; another is scanning the industry's public relations practices and ambitions; still another seeks to determine gas utilities' servicing responsibilities. Gas utility membership declined slightly during the year, due to consolidations, but continued to represent 90% of the nation's gas utility customers.

The whole report is strikingly produced and effectively illustrated by photographs, drawings, and diagrams and touches upon every phase of the Association's widespread activities from the PAR (promotion, advertising, research) Plan to accident prevention and awards. In short, it pictures a great industry at work on a hundred different levels. We like the A.G.A. idea of awards for meritorious service to the industry not only in the technical but also in the sales and home service fields. In this country, with the exception of the Birmingham Medal, the reading of a paper is a *sine qua non* of an award. In America, achievement alone is sufficient. There are, for example, the Distinguished Service Award for outstanding technical attainments, the Home Service Achievement Award, together with Sales Promotion Awards. As the 1951 President of the A.G.A., Mr. D. A. Hulcy, remarks in the foreword, the report demonstrates the fundamental soundness of an industry which has developed a spirit of co-operation and co-ordination that spells progress. 'If we continue to act in concert,' he concludes, 'there is no limit to the heights our industry will reach.'

Diary

July 11.—Midland Section, I.G.E.: Summer Meeting, Leamington Spa, 11 a.m. Visits to gasworks, S. Flavel & Co., Ltd., and Warwick Castle. Ladies invited.

July 16.—South Western Section, I.G.E.: Summer Meeting and Ladies' Day, Barnstaple.

July 21.—Eastern G.C.C.: Connaught Rooms, Kingsway, W.C.2, 2 p.m.

July 21.—West Midlands G.C.C.: Dudley Room, Queen's Hotel, Birmingham, 2.30 p.m.

July 31.—North Thames G.C.C.: Westminster City Hall Charing Cross Road, 2.30 p.m.

Personal

Mr. V. E. Green, Engineer in Charge of the Birmingham Industrial Research Laboratories, has retired after 36 years' service with the Birmingham Corporation. First appointed in 1916 as Assistant Engineer to Dr. C. M. Walter, then Engineer in Charge of the Gas Department's Industrial Research Laboratories, Mr. Green spent the greater part of his time with the former Gas Department, and the Birmingham division of the West Midlands Gas Board therefore joined with the Public Works Department in making a presentation to him on his retirement.

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Mr. P. N. Langford, Engineer, Manager, and Secretary of the Rugby undertaking since 1948, has retired after 50 years' service in the gas industry. He entered the service of the former Coventry Gas Department as a chemist in 1902 and in September, 1945, he retired after 27 years as Engineer and General Manager of that undertaking. About a year before nationalisation he accepted the invitation of the Directors of the Rugby Gas Company to succeed the late Mr. R. J. Miekle-john as Engineer, Manager, and Secretary at Rugby until vesting date and thereafter for such period as the West Midlands Gas Board might determine. To mark his retirement he was presented with a coffee table and an umbrella, the presentation being made by Mr. A. Allen, Divisional General Manager. Mr. Langford is to be succeeeded at Rugby by **Mr. A. E. West,** at present Engineer and Manager at Coventry.

Mr. R. W. Martin, Assistant Engineer at Cannock, West Midlands Gas Board, has left to take up duties as Deputy Engineer at Wrexham, Wales Gas Board. He had completed nearly 20 years' service with the Cannock undertaking and to mark the regard in which he was held by his colleagues a presentation of two fireside chairs was made to him by Mr. T. E. Parry, Group Engineer, at a social evening preceding his departure.

Obituary

Mr. Charles E. Harrison, Distribution Superintendent of the Scarborough district of the North Eastern Gas Board, died suddenly last week. He had been employed with the Scarborough undertaking for 35 years.

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Mr. Gilbert R. Macfarlane, late Engineer and Manager of the Nelson gas undertaking, died at his home on June 23. He was 58 years of age, having retired for reasons of health in May, 1951. Mr. Macfarlane had 40 years' service in the gas industry, commencing at Greenock in 1911. He became Deputy Engineer and Manager at Nelson in November, 1922, and in 1926 was appointed Engineer and Manager of the Tipton, Staffs, undertaking, where he remained until 1933, when he returned to Nelson as Engineer and Manager.

NATIONALISATION ANALYSED

THE National Coal Board took only five months to produce its fifth annual report, and assuming that the gas industry will be no less eager to give an account of itself many people are looking forward to the third annual reports of the Gas Council and the area boards. Meanwhile there has been published a more profound study of nationalisation in general,* in which the Editor, William A. Robson, Professor of Public Administration at the London School of Economics and Political Science, brings together 14 essays on various aspects of what he describes as the most important constitutional innovation which has been evolved in Great Britain during the past 50 years. The essays are by various authors, including Professor Sargent Florence, Mr. A. Albu, M.P., Mr. Ernest Davies (Parliamentary Under-Secretary for Foreign Affairs), Professor G. D. H. Cole, Professor W. Arthur Lewis, Sir Arthur Salter, and Mr. Leslie Hardern (Public Relations Officer of the North Thames Gas Board). In his first chapter Professor Robson comments on the diversity deliberately introduced into the forms and organisation of the nationalised industries. It was the intention of Parliament to avoid uniformity in the experimental phase, and even in nomenclature there is great variety—the Coal Board, Transport Commission, Gas Council, Electricity Authority, and Colonial Development Corparation to mention only a few—yet all are public corporations. If the public corporation performs efficiently and well the tasks for which it was designed, and if it conducts its affairs with a true sense of its accountability to the Government, to Parliament, to its staff and workpeople, and, above all, to the consumers, then it will signify an achievement of high creative value on the part of our democracy. In Professor Robson's opinion there is good reason to feel hopeful. The public corporation, he says, is destined to play as important a part in the field of nationalised industry in the 20th century as the privately owned corporation played in the realm of capitalist organisation in the 19th century.

Mr. Albu, M.P., in his chapter on organisation, after describing in some detail the set up of the area gas boards, says a successful balance between decentralisation of management and central control of policy rests in the last resort on the establishment of harmonious relations between the persons concerned. Those relations take time to establish and are obviously less likely to be found in any large organisation brought suddenly into being than in one which has been subject to a long period of growth. The results by which the boards will eventually be judged will depend on the extent to which their leading members have understood these facts and on the influence which their personalities have exerted throughout the undertaking. The difficult problem of ministerial responsibility and parliamentary control in relation to public corporations has not been solved, says Mr. Ernest Davies, M.P. He concludes: 'It would probably be asking too much to suggest that Government and Opposition parties should consider their duty to the community to consist of an objective examination of nationalised undertakings and to remove them from the field of political controversy . . . . therein lies the ultimate solution of this difficult problem.'

There is an interesting chapter on joint consultation, which A. M. F. Palmer says 'is no miracle worker; no sovereign remedy for overcoming maladies which are, perhaps, inescapable in an industrial society, but like wholesome surroundings, fresh air, and cleanliness in our personal lives, it can tremendously assist in reducing the incidence of disease.' Frank Milligan discusses the consumer's interest and says the responsibility laid on public undertakings as a concomitant of their monopoly powers is universally recognised to be a heavy one. That responsibility should not be diffused or impaired, and it is not intended that consumers' councils or tribunals should in any way release the boards from their obligations. But it is no less important to consumers that there should be adequate means whereby that responsibility may be brought home to the public undertakings. There will be general agreement with Mr. Leslie Hardern's views on public relations. If the functions of public relations departments are properly discharged by a skilled and competent staff they will ensure that instead of having a large, incoherent, and unresponsive organisation, unpopular with the public, there will be mutual respect, mutual helpfulness, and mutual co-operation in a continuous improvement in efficiency and service and morale throughout the country.

Part II comprises a substantial body of general conclusions by Professor Robson related to the earlier chapters. He reaches the final conclusion that nationalisation as an important part of post-war reconstruction must succeed for the simple reason that failure would be a national disaster of staggering dimensions. Members of the governing boards—and this is certainly true of those in the gas industry—are devoting themselves wholeheartedly to promoting the progress and well-being of their undertakings. 'It is necessary,' says Professor Robson, 'to see both the achievements and the shortcomings of the nationalised industries against a wider background and in a truer perspective.'

A. C. C.

* Problems of Nationalised Industry. Edited by Professor W. A. Robson. George Allen and Unwin, Ltd. 25s.

SCOTTISH ANNUAL MEETING

PRELIMINARY notice has been given of the annual general meeting of the Scottish Association of Gas Managers, to be held at the Barrfields Pavilion, Largs, on September 11, under the Presidency of Mr. E. G. Smith. Golf and bowls competitions will be held on September 10, and the annual excursion will take place on September 12, taking the form of a voyage from Largs via Wemyss Bay, the Kyles of Bute, to Arran and returning to Largs, with luncheon on board. There will be a reception and dance at the Moorings, Largs, on the evening of September 11. By invitation of the Chairman and members of the Scottish Gas Board the ladies will be entertained to an outing to Prestwick Airport, where tea will be served, on the afternoon of the meeting.

The golf competition for the Circle Challenge Bowl will be over the course of the Glasgow Golf Club at Gailes. Communications about the competition should be sent to Mr. W. P. Rae, 82, Gordon Street, Glasgow, not later than August 25.

The bowls competition will be on the Douglas Park green, Largs, and entries should reach Mr. T. Thomson, New Grange Works, Edinburgh, 11, not later than August 1. The ladies' golf competition for the Handley Salver and other prizes will be over the course of the Largs Golf Club, Kelburn, and entries should be sent to Mrs. G. E. H. Keillor, 'Mossneuk,' Airdrie. A putting competition for ladies will be held on the Barrfields municipal green on the morning of September 11.

Farewell After 50 Years

MR. T. Wheeler retired on July 4, after 50 years with the Parkinson Stove Company, of Stechford, Birmingham. Mr. Wheeler joined the original company—W. Parkinson and Co., of Springhill, Birmingham—in 1902, and moved to Stechford in 1913 when the Parkinson Stove Company was formed.

Sixty-five years old, Mr. Wheeler remembers when the site of the present factory was open fields; and recalls that in the early days at Parkinsons he had to make his own tools. Two years ago he transferred to Monitor Engineering and Oil Appliances Ltd., a Parkinson subsidiary. A member of the Parkinson and Cowan Long Service Association, he plans to devote his retirement to his garden—and fishing.

He is the second long-service employee to depart in recent weeks. The first was Mr. A. Warner, former chargehand brazer, who left after 37 years with Monitor Engineering Appliances Ltd. When he retired, he was presented with a cheque from the company, and a silver watch from his workmates.

Ladies' Day

THE Manchester District Junior Association of Gas Engineers held its Ladies' Day at Morecambe on June 21. The Association met at the offices of the Lancaster undertaking and split up into two parties to visit the Lancaster works and the Castle.

After the visit lunch was provided by the North Western Gas Board at Morecambe. The members and their ladies were free to go their own way during the rest of the day.

An Explosion and Fire at the Skinningrove unit (Yorks) of the Northern Gas Board on July 3 resulted in a good part of the East Cleveland area being without gas for some time. There were no casualties and the fire was put out after an hour's work by Loftus fire brigade. The offices, laboratory, and some of the works plant were destroyed or seriously damaged.

Brussels Coke Ovens

IN our report of the fifth conference of the International Gas Union at Brussels (*Journal*, July 2, p. 33) it was stated in regard to the Brussels coke oven plant on the Canal Maritime that 'the ovens here are of the Lecocq system.' We are informed by Gas Chambers and Coke Ovens, Ltd., that one of the two batteries is of U.C.B. ovens constructed by the Union Chimique Belge; that it has been in continuous operation for 23 years and is still in excellent condition, as was remarked by some members of the British group.

Visit to Beckton

THE North Thames Gas Consultative Council met at Beckton on June 26, Councillor Edwin Bayliss, D.L., J.P., presiding. Members of the Council and its four district committees were shown over the works. At the business meeting which followed, the Council received with regret the report of the death of Councillor C. F. Seaton (West Ham). The Council approved the appointment of two new members of district committees: Metropolitan District, Councillor H. Foxon (Hackney); Berkshire and Buckinghamshire, Councillor D. G. Williams (Great Missenden).

Notification was given of the approval of the Minister of Fuel and Power to the proposed amendment to the scheme for appointment of members of district committees, which now allows the Council to appoint other members in place of members of the Council who do not wish to serve on district committees.

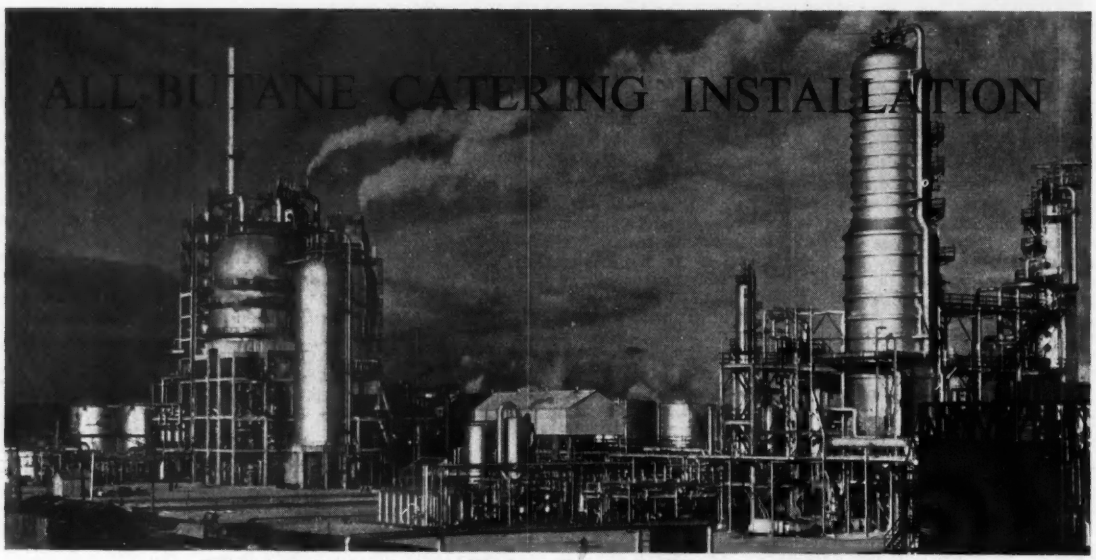
Details were given of three complaints from consumers which had been received and dealt with since the last meeting. In two cases the Council had been successful in persuading the Board to withdraw charges disputed by the consumer.

FRANKIPILE COMING-OF-AGE PARTY

THE Franki Compressed Pile Co., Ltd. (Frankipile) at its recent Coming-of-Age birthday celebrations marked the Company's successful record in this country and did honour to the inventor of the Frankipile and founder of the Company, Mr. E. Frankignoul. The other principal guest of honour was the founder of the English Company, Commander D. McG. Newton. The present Chairman and Managing Director, Mr. W. McCarthy, was in the chair. The banquet was held at the May Fair Hotel and was attended by a large gathering of architects and engineers.

A few of the guests at the anniversary celebrations. Standing left to right—Mr. W. McCarthy (Chairman and Managing Director), Mrs. D. McG. Newton, Mr. E. Frankignoul (Founder and Inventor of the Frankipile), Commander D. McG. Newton (Founder), Mrs. W. McCarthy.

ALL-BUTANE CATERING INSTALLATION



'Cat' Cracker and two-stage crude unit at Fawley: An Esso photo by William Martin, Ltd., Southampton

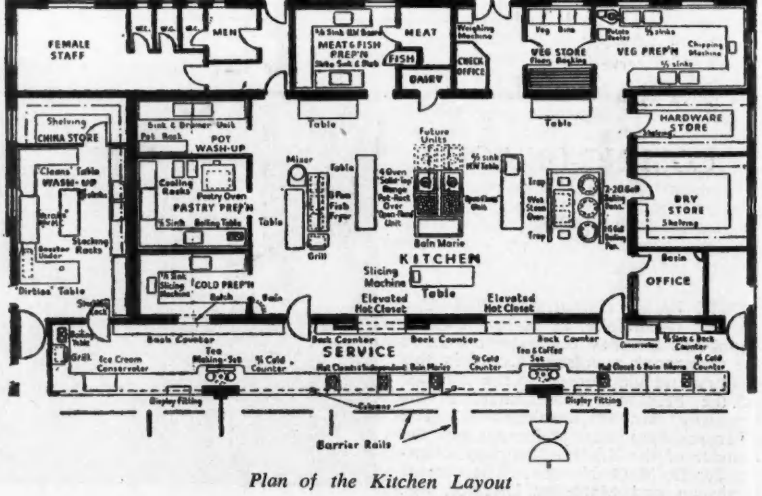
We had the privilege the other day of inspecting what we believe to be the only all-butane catering installation of its kind in the country. On the peaceful, tree-lined western shore of Southampton Water has sprung up Europe's largest oil refinery, where Benham & Sons, Ltd., have designed and equipped for the Esso Petroleum Co., Ltd., a kitchen with ancillary services capable of providing for upwards of 1,000 persons at one sitting.

THE famous Fawley flame (which the first night it blazed out of the top of its slender 250-ft. chimney is said to have 'alerted' half the fire brigades in south Hampshire) will guide you, even in daylight, to the vast Esso refinery. Close to where the marine terminal, capable of berthing at one time four ocean-going tankers, juts out into Southampton Water, PLUTO started on its course to supply the allied forces on the Continent with the self-same product with which the new refinery is largely concerned today. What is left of this unique war-time operation, stretching rather forlornly across the marshy shore, looks pitifully insignificant alongside the conglomeration of huge pipes extending from the new refinery to the jetty.

It would be too long a story, and not within our province, to tell here of the construction of this £37½ mill. project, which went 'on stream' in a little over two years after the first bulldozer began to level the site; of the prodigious amount of careful preparation and tooling, down to tne smallest detail, and working to no fewer than 6,000 blueprints; of the problems involved in gathering together from all over southern Hampshire more than 5,000 workmen to build the plant in a comparatively rural area. All that is now past history; but it remains, nevertheless, an epic of achievement, which has brought to this country a plant capable of producing 6½ mill. tons of petroleum products and of saving Britain well over 100 mill. dollars a year.

If you were blindfolded and dropped without warning in the middle of Fawley's 450 acres you might be excused for thinking, on opening your eyes, that you had been projected on to a typical oil plant in the States—an impression produced not only by the wide 'avenues' bearing American-sounding names, by the amazing tangle of pipes and mains, by the fantastic shapes of this aluminium painted city of tubes, towers, and columns, but also by the very obvious Americans you run into at every turn, whose delightfully unconventional mode of dress picks them out instantly from their British colleagues. Not that this impression is in the least surprising, since the whole enterprise was the result of Anglo-American co-operation, and many American technicians who helped to build the plant have stayed to assist in its operation.

With this American background and flavour it was not unnatural that due regard should be paid to American practice in the matter of canteen facilities, though the type of equipment normally employed in our own catering establishments dictated certain essential divergences from American practice and has resulted in arrangements which are much more typical of the best traditions of British catering than of Ameri-



Plan of the Kitchen Layout

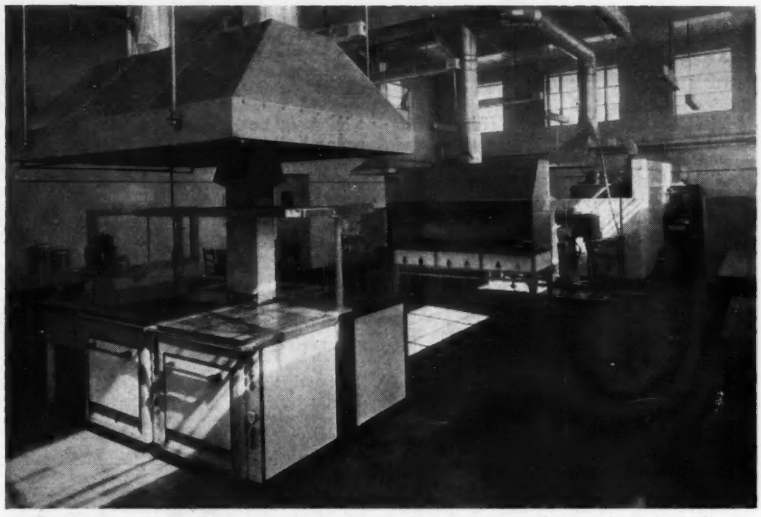
can. For example, it is not uncommon in American kitchens to find the equipment of many different makers—with obvious detriment to appearance and co-ordination of layout. Over here it is more usual for the whole contract to go to one principal firm, which is responsible for designing and equipping the entire kitchen and ancillary services. And this brings us to the chief purpose of our present article—which is to describe what is thought to be the largest all-butane catering installation in this country.

Completely designed and equipped by Benham & Sons, Ltd., this kitchen ranks among the most up-to-date and impressive we have seen, and we were also fortunate in being enabled on the occasion of our visit to judge its efficiency as well. We chanced to be behind the scenes at the moment when the lunch hooter brought between 400 and 450 refinery workmen pouring into the canteen and lining up at the service counter. Within little more than five minutes the whole lot had been served and were seated at their tables enjoying a first-class lunch which, at the very most—*i.e.*, by taking the full three courses *and* coffee—cannot cost as much as 2s. The catering, incidentally, is undertaken directly by the organisation, and the meals are served on the ticket system.

The kitchen is a splendid example of modern design—bright and fresh, with glazed tiles about 6 ft. up the walls and cream finish above. The ceiling must be all of 20 ft. high, with plenty of roof lighting; most of the appliances are individually vented, and it was an unusual experience to find the atmosphere of the kitchen (immediately after the cooking of hot meals for 400 or more people) very much cooler and fresher that that of the canteen. Ventilating fans change the air completely 30-40 times each hour.

The butane is supplied in two 200-gal. containers which are housed in an adjacent building. One container is on tap while the other is stand-by. They are fitted on trollies for convenient handling. Each container is capable of providing a week's supply of gas at 16 in. W.G. The C.V. is 2,680 per cu.ft.

The general design and layout of the kitchen and servery are on the latest lines, with the arrangement of the various sections in natural sequence. Where appropriate, some of the sections are divided off by 5 ft. high glazed tile walls, thus providing a degree of separation without interrupting the free access of light and air. All equipment standing adjacent to the walls is set slightly away therefrom to avoid dirt traps and to facilitate cleaning. The ancillary departments—cold room, vegetable and fish preparation rooms, stores, etc.—are conveniently sited, mainly on the cool north side, to avoid unnecessary movements. Hotclosets are built into the wall between the kitchen and the servery so that dishes can be loaded on one side and withdrawn from the other. All the sinks are of stainless steel, and there is a glazed screen above the full length of the servery.



General view of the kitchen with Solid-Top range in centre

The head chef, who spoke very highly of the gas equipment, gave us an interesting fact regarding the tastes of the personnel for whom he caters. Irrespective of weather or temperature conditions, he said, hot dishes were generally chosen by 95% of the workmen and by 60% of the office staff. The secret of the rapid service lies in getting everything ready before the 'rush' starts and in staggering the lunch hours of the workmen and staff.

The butane gas apparatus consists of a central pattern four-unit 'Solid-Top' range, two units having open flame burners, with steam-heated bain marie attached; a double-deck pastry oven with two independent compartments each fitted with dial thermometers; a three-pan fish fryer with stainless steel hood; and two 24-in. grillers and toasters. Other appliances, which are steam-heated, include three-compartment wet steam oven; two 20-gal. and one 15-gal. boiling pans; two elevated built-in hotclosets; a 'Hercules' high capacity dish-washing machine, together with the cold and hot service counter with six hotclosets and five independent bain maries, and tea and coffee apparatus. All appliances are finished in mottled grey vitreous enamel and white panels.

It is worth recording that Benhams also provided the equipment for the construction camp canteen which served the army of workmen who erected the refinery.

A section of the 85-ft. long service counter at Fawley

IN PARLIAMENT — Fireguards Bill

THE Heating Appliances (Fireguards) Bill was read the third time and passed on June 27. Moving the Third Reading, Mr. DENYS BULLARD (Norfolk, South-West) briefly reiterated the purposes of the Bill, which, he observed, were rather wittily summed up by the editor of a local paper in his division which said that two possible alternative titles might be 'The Lady's Not For Burning,' or 'Why should Christopher Fry.' However, this was a serious and important matter. The Bill did not aim at mollycoddling; it still required people to exercise ordinary commonsense precautions in the home.

It had been criticised for the fact that it did not go far enough, and to those who complained that many other classes of heating appliances should have been included in it he would only say that they hoped it might be the forerunner of other Bills which would play their part in preventing a number of accidents in the home. He would like once again to pay tribute to the work of Dr. and Mrs. Colebrook and to the many other surgeons and medical men who were, after all, in the best position to appreciate this particular danger.

Political Meetings in Nationalised Premises

Mr. K. ROBINSON (St. Pancras, North) asked the Minister of Fuel and Power at Question Time on June 30 if he would make a statement as to the general directions he had given to the Boards of publicly owned industries for which he is responsible concerning the placing of their premises at the service of a political party.

Mr. GEOFFREY LLOYD said he had given no general directions to the Boards of the nationalised fuel and power industries on this subject, whereat Mr. ROBINSON called attention to leaflets advertising the St. Pancras, North, Conservative Association's Midsummer Market, which were displayed on the counter of the London Electricity Board's showrooms and the North Thames Gas Board's showrooms in Camden Town; and to the fact that competitors in the cookery competition, which, he said, was expressly designed to raise funds for the Conservative Party, were instructed, on the back of the leaflet, to hand in their entries, with their entrance fees, to those showrooms.

Mr. LLOYD said he had made enquiries, and it was quite clear that a mistake had been made. There was, however, a general question which arose for consideration by the House. He believed that the most satisfactory method of getting these sorts of matters decided would be to have a conference, either through the usual channels or the party organisations, to ensure, absolutely clear, that nothing wrong was done and that there was complete fairness between the parties.

Public Lighting Engineers

MR. NORMAN HUDSON, M.B.E., Chief Commercial Officer of the North Eastern Gas Board, will present a paper on 'Street Lighting—A Wise Compromise' at the annual conference of the Association of Public Lighting Engineers at Harrogate, which is to be held on September 16-19. Most of the other papers deal with electric lighting, but there is one of common interest on 'Design, Manufacture, and Erection of Concrete Lighting Columns' by Dr. D. F. Orchard, of the Cement and Concrete Association.

The usual full programme of technical and social events has been arranged. Mr. E. Howard, City Lighting Engineer, Nottingham, will be inducted as President on the opening morning of the conference and will deliver his Presidential Address in the afternoon.

An exhibition of street lighting apparatus and equipment will be held in a marquee near the Royal Hall (conference hall). In the grounds at the rear of the Royal Hall there is also to be staged an outdoor display of lamp columns and tower wagons, extending ladders, bollards, traffic signs, etc. Firms who have indicated their intention of participating include Automatic Telephone and Electric Co., Ltd., British Foreign & Colonial Automatic Light Controlling Co., Ltd., Concrete Utilities, Ltd., the Gas Council, Gowshall, Ltd., Horstmann Gear Co., Ltd., John Kerr & Co., Ltd., R. A. Lister & Co., Ltd., Parkinson & Cowan (Gas Meters), Ltd., Stanton Ironworks Co., Ltd., Stewarts and Lloyds, Ltd., Wm. Sugg & Co., Ltd., and Vauxhall Motors, Ltd.

A Full Day's Outing

HEAD office and main works staff of George Wilson Gas Meters, Ltd., at Coventry have made it a custom since the war to hold a summer outing. This year's event was on June 21, and was ambitious in its scope. Many employees and staff, accompanied by Mr. W. D. Wilson, Managing Director, Mr. F. C. Wilson, and Mr. D. C. E. Poole, Directors, left Coventry at 8 a.m. for Reading and took a boat from there to Henley. From Henley they proceeded to Windsor, having a picnic lunch en route, and left for London for dinner, at which formalities and toasts were strictly barred. Afterwards the party separated, a large number attending various theatres, while others went to the pleasure gardens at Battersea Park. The party re-assembled at 11.30 p.m. for the return to Coventry, following a day which was voted by all to have been one of the most successful and happy ventures run by the social club, to which the management attaches much importance, encouraging as it does mutual goodwill, understanding, and co-operation in the day-to-day activities of the Company.

On Tuesday evening, June 24, after working hours, a cricket match was held between the staff and works, which resulted in a win for the works team, who have reached the semi-final round of the Sheet Metal Workers Cup, open to all firms in Coventry and district.

COMPANY NEWS

DE LA RUE

For the sixth successive year, Thomas De La Rue is maintaining its equity distribution. The increase in the interim dividend from 15% to 20% made last October and the 100% scrip bonus effected in March had raised hopes that an increase might be forthcoming. But the final dividend of 15% on the doubled capital entails the same total payment and presages a future dividend rate of 25%. Profits in the year ended last March rose £114,000 to £660,000 and, even after heavier taxation, the net profit is up by £67,000 to £254,000. But £23,000 of this total arises from a provision no longer required.

SIMON-CARVES

Group profit for 1951 £411,115 (£524,255) plus transfer from provision for retention balances on completed contracts £180,978 (deduction £138,082), dividends and interest £20,539 (£15,039). To taxation £263,575 (£234,648). Final dividend 5%, making 17½% for year on reorganised capital (30% on former capital). To general reserve £33,675 (£50,000). Staff benefits reserve £50,000 (£25,000), investment reserve nil (£8,691), special depreciation £30,000 (£20,000), forward £250,996 (£129,621). Current assets £4,563,242 (£3,725,146), liabilities £3,728,169 (£2,667,151).

FOSTER TRANSFORMERS LTD.

Foster Transformers and Switchgear, Ltd., of Wimbledon (a Lancashire Dynamo Company), announce a change of name. The Company will in future be known as Foster Transformers, Ltd. This development follows the transfer of switchgear manufacture to Bridgwater Somerset, 12 months ago and the formation there of a new company, Lancashire Dynamo Switchgear, Ltd. Fosters will continue to manufacture transformers, test equipment and voltage regulators.

BRITISH OXYGEN

The possibility that the British Oxygen Company will need to raise more capital is indicated in an announcement of a scrip bonus. The distribution will capitalise £2,081,461 of reserves for an issue of £1 ordinary shares by renounceable allotment letters in the proportion of one for every £2 of stock held. Treasury consent has been obtained. The new ordinary shares will rank in full for any interim and final ordinary dividends to be declared in respect of the year to December 31, 1952. An increase in authorised capital from £10 mill. to £15 mill. is proposed by the creation of 5 mill. £1 shares.

(*Concluded at foot of opposite page*)

LONDON & SOUTHERN SECTION SUMMER MEETING

THE Summer Meeting and Ladies' Day of the London and Southern Section of the Institution of Gas Engineers was held on Tuesday, June 24, when an interesting and varied programme coupled with perfect weather went to make up a most enjoyable and memorable day.

There were alternative visits in the morning to the Fulham gasworks, the Fulham research laboratories, and to Watson House, after which the large gathering of members and their ladies assembled at the Chelsea Town Hall for luncheon at the kind invitation of the North Thames Gas Board. The Chairman of the Section, Dr. A. E. HAFFNER, presided, and the North Thames Board was represented by two of its members, Mr. L. C. Hansen, M.B.E., and Mrs. I. T. Barclay, B.A. Also present were the Mayor and Mayoress, and Town Clerk of Chelsea, Mr. J. H. Dyde, immediate Past-President of the Institution, and representatives of kindred organisations.

Proposing the toast of the Section, Mr. HANSEN remarked that although this was only their second year as a District Section of the Institution of Gas Engineers it was actually their 77th year as a senior technical professional body. Organisations such as theirs were responsible for making the industry what it was today, and he referred to the high standard of the papers presented to the Section. There were many heart-burnings when the former Association decided to change its name, but their progress during the past two years had amply justified that decision. That progress was in large measure due to their excellent chairman and officers. Their present Chairman, Dr. Haffner, with whose name he coupled the toast, had done an extraordinary amount of good work for the North Thames Board.

Dr. HAFFNER, responding to the toast, acknowledged his thanks to the Board for being so encouraging and sympathetic to the Section during his year of office, and he asked Mr. Hansen and Mrs. Barclay to convey to the Chairman and the rest of the Board their grateful appreciation not only of their hospitality that day but also for allowing its officers to present papers and have time to attend their meetings. In conclusion, Dr. Haffner extended a special welcome to all their guests.

After lunch, the members and their ladies embarked from Cadogan Pier and travelled by launch downstream to see the new coaling jetty at Nine Elms gasworks, returning upstream as far as Isleworth, where they visited Syon House, home of the Duke of Northumberland, and toured the state rooms and grounds.

A group of members outside the Fulham research laboratories. On the extreme left is Dr. A. E. Haffner, the President, and, fifth from left, Mr. A. F. Grant, Hon. Secretary and Treasurer.

COMPANY NEWS —
Concluded from previous page

CANNON IRON

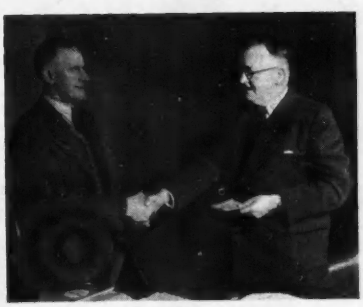
The name of Cannon Iron Foundries has been changed to Cannon (Holdings) and the capital increased to £1,500,000 by the creation of 2 mill. ordinary shares of 10s.

WEST'S GAS

Consolidated trading profit of West's Gas Improvement Co., Ltd., for year ended March 31, 1952, £208,820 (£204,562), and net profit, after tax of £100,442 (£95,591), including E.P.L. £3,000 (nil), was £58,145 (£60,108). Profit of parent company £42,244 (£42,210). Final dividend on ordinary 5% and bonus 2½% (both same), making 12½% (same) for year. Bonus ½% (same) on 10% participating preference. Provision against research and experimental expenditure nil (£25,000), reserve £10,000 (£7,500), minority interests nil (£1,950), contingency reserve £29,316 (£20,684), tax adjustment nil (£16,073), forward £52,338 (£42,876), of which £45,094 (£42,720) is attributable to parent company.

FAMILY TRADITIONS

MANY employees of Robert Dempster & Sons, Ltd., Rose Mount Iron Works, Elland, Yorks, have completed 50 years' continuous service with the firm, and one whose attainment has just been recognised was Mr. Ernest Rawnsley, a template maker in the constructional department, who was presented by Mr. B. C. Morton, Managing Director, with savings certificates, on behalf of the Directors, to mark the occasion.



Mr. B. C. Morton makes the presentation to Mr. E. Rawnsley.

Behind the ceremony lies a story of family craftsmanship going back to 1876 when Mr. Rawnsley's father commenced as an apprentice with the same firm. Mr. Rawnsley's father travelled extensively in connection with the erection of gasholders, visiting Vienna among other places during the last century. When he retired in 1934 he was in charge of the template shop, and had completed 57 years' service.

Mr. Ernest Rawnsley had six brothers, all of whom were skilled tradesmen, and who worked with the firm during the course of their life, and all but one served their apprenticeship with the firm. Two of Mr. Rawnsley's brothers have also completed 40 years' service, and the total service of Mr. Rawnsley, Sen., and his seven sons amounts to over 250 years.

The Company is proud of such a record. Of the present works employees and staff, over 25% have a record of service of 25 years and more.

Preparing to Meet Gas Demand in

Harlow New Town

The Eastern Gas Board expects to have to meet a maximum demand of 3 mill. cu. ft. of gas per day at Harlow New Town, Essex, when the present scheme for housing a population of 80,000—20,000 more than originally proposed—has been completed. Rapid progress is being made, and the Harlow Development Corporation now expects to produce 1,000 dwellings a year.

PRIMARILY intended to decentralise industry and to reduce overcrowding in London, Harlow is developing along parallel lines, industrially and residentially. The Development Corporation has adopted a wide variety of architectural styles, modern and traditional—there are about 70 different types—and, to ensure a balanced population, provided in the various 'neighbourhoods' for a distribution of dwellings to meet the needs of the lower, middle, and higher income groups, with accommodation ranging from one-room flatlets to five-bedroomed houses.

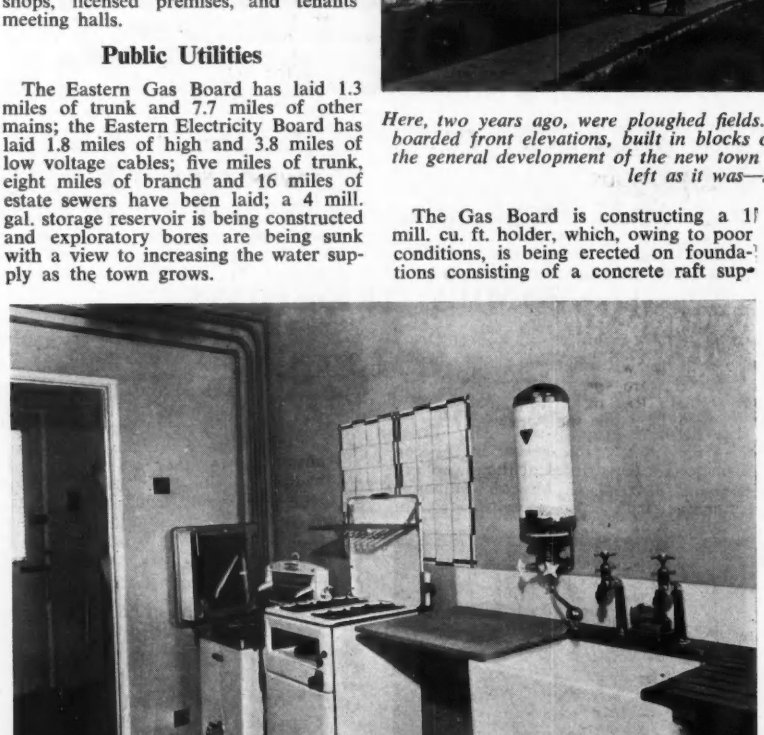
To attain the desired variety in design and layout, the Corporation utilises the services of its own staff and architects in private practice, the aim being that three-fifths of all dwellings shall be designed in the Corporation's offices. So far, the staff have designed 31 different dwelling types as well as factories, shops, licensed premises, and tenants' meeting halls.

Here, two years ago, were ploughed fields. Now these attractive houses with half-boarded front elevations, built in blocks of four, are all in occupation. Typical of the general development of the new town is that the slight rise in the land has been left as it was—so has the tree.

Public Utilities

The Eastern Gas Board has laid 1.3 miles of trunk and 7.7 miles of other mains; the Eastern Electricity Board has laid 1.8 miles of high and 3.8 miles of low voltage cables; five miles of trunk, eight miles of branch and 16 miles of estate sewers have been laid; a 4 mill. gal. storage reservoir is being constructed and exploratory bores are being sunk with a view to increasing the water supply as the town grows.

The Gas Board is constructing a 1 mill. cu. ft. holder, which, owing to poor conditions, is being erected on foundations consisting of a concrete raft supported on 307 reinforced concrete piles 40-45 ft. long. As development proceeds a second 1 mill. cu.ft. holder will be erected.



Part of the spacious kitchen in one of the new houses showing the gas washing machine, gas cooker and sink water heater all lined up in workmanlike fashion.

Meanwhile, gas is supplied from the Board's works at Ponders End. To take the supply to the new town a 12 in. steel high pressure main was laid across nearly seven miles of open country, under the main Cambridge-London railway line, over Dobbs Weir at Hoddesdon, across brooks and ditches, and through woodlands. The main was lowered into prepared trenches in 100 ft. lengths, the pipes being jointed and welded above ground.

Until the laying of this new main, Harlow's gas supply came from the Bishop's Stortford works, which has a gas-making capacity of a little over 1 mill. cu.ft. per day and could not hope to cope with the demands of the new town.

Housing Development

Acceleration of the building programme necessitates acceleration of the programme of civil engineering works. Roads are constructed and main services installed before the building contractor begins to work on the site; road works completed and under construction to date include 3½ miles of projected classified roads, 10½ miles of estate roads and ¾ mile of independent cycle tracks.

The new town is being built area by area, concentrating first on the Mark Hall and Netteswell 'neighbourhoods,' where there are now 660 occupied dwellings and a further 1,500 under construction. These figures include a wide variety of size and type of dwelling—one-roomed flatlets, one, two, three and four-bedroomed flats, and two, three, four and five-bedroomed houses. There are three, four and ten-storey flats, two and three-storey houses, maisonettes, and 'flatted' houses, terraced, semi-detached, and detached.

The layout has been formed around the contours and existing natural features of the land, which will be emphasised by landscape treatment. Natural parks will be retained and sports grounds and playing fields incorporated so that there will be six acres of open spaces to every thousand inhabitants. The entire town will be surrounded by a green belt of agricultural land and woodlands.

Completion by 1967

Average density of dwellings is 15 to the acre, giving an average of 100 sq. ft. of garden to each house. To make provision for a population of 80,000 as against 60,000, the net density figure has been pushed up from 38 persons to the acre to 50. Thus, by some extension of actual size of housing areas and more economic use of land and road frontages, the higher figure can be achieved without extending the boundary limits.

The scheduled date for completion of the new town is 1967, but if progress continues at the present rate it is likely to be considerably sooner. In fact, it is anticipated that there will be a population of 50,000 by 1957-8 if the target of 2,000 dwellings a year is reached.

With the exception of a few flats, interior heating is by means of a gas-ignited smokeless fuel grate in the living-room, which also heats the water, while tenants have a free choice of gas or electricity for cooking and other domestic purposes. The Corporation provides a standard gas wash boiler in every dwelling unless the tenant already possesses one or prefers to purchase another type of his own choice.

Kitchens have concealed gas and water supplies to a prefabricated fitting for a sink water heater. Experience to date has shown that 23% wish to retain the water heater, while 74% have chosen gas for cooking.

Points are provided for gas refrigerators where there is space, and in houses with larger-than-average halls points are provided for gas radiators and space heaters.

The industrial development policy of the Corporation is based on three types of buildings—special purpose premises to be built by industrialists on sites leased by the Corporation for terms up to 99 years; standard factories of about 20,000 sq. ft., erected by the Corporation and either let at rack rents or sold subject to ground rents; and sectional factories built by the Corporation and let to industrialists at rack rents in units of approximately 2,000 sq. ft.

The production area in the standard factories is lit by monitor roof lighting, achieving an average daylight factor of 7.5%, stanchions at 24 ft. centres giving uninterrupted floor space totalling 13,824 sq. ft., with room for expansion by a further 4,608 sq. ft. if required. Ample locker rooms and cloak rooms for men and women are provided, as are also rest and first-aid rooms, while an inquiries and telephone room is incorporated on the ground floor, together with a waiting or interviewing room. On the first floor there is office space of 2,160 sq. ft., plus cloak rooms for the administrative staff. A gas-fired boiler is provided and a low-pressure heating system installed, with unit heaters at high level in the production space and radiators in the administrative block. The type of high level unit heaters is left to the choice of the occupiers.

Sectional Factories

Each sectional factory has a total area of 2,100 sq. ft. and can be used as a self-contained unit complete with an office, lavatory accommodation and storage space; alternatively, several bays may be combined, forming one factory with office and ancillaries as required. The area of the production space of one bay exclusive of ancillaries is 1,770 sq. ft.

Three standard and eight sectional factories are occupied and in production, while one special type, six standard and five sectional factories are under construction, making a total of 300,000 sq. ft. of factory space. In addition, negotiations are in hand for a further 87,000 sq. ft.

Residents of the new town at present have to do their shopping in old Harlow, but they will soon have their own shops. Initially, the shops are being restricted to the essential trades, but others will follow in due course. The Eastern Gas Board is supplying space heaters, radiators, wall panel heaters and water heaters. In addition to these main shopping centres, which will be repeated in other 'neighbourhoods' as they take shape, groups of 'round the corner' shops will be sited at various sub-centres to meet the day-to-day needs of the housewife.

Educational Facilities

Educational facilities within its own borders will include 12 primary schools, five secondary schools and a county college. Each of these will stand in its own grounds, which will retain all possible natural contours.

Meals provided in the temporary school are cooked by gas, the equipment consisting of a double oven range, a steamer, vegetable boiler, and a sterilising sink. Gas equipment in the new primary school will include a double oven range, two steaming ovens, a 20 gal. boiler and a 30 gal. boiler, two rinsing sinks, and emergency lighting.

Gas is playing an important part in the building contractors' site canteens, too. That of G. Wimpey & Co., has two 10 gal. boilers, two double oven ranges and a 15 gal. vegetable boiler, while Kirk & Kirk's canteen operates two large cookers, two boilers, a multi-point water heater, a hot closet and a radiator, while lighting is by gas.

Gas-making Oils

METHODS of evaluating oils for gasification are presented in two new numbers of the Institute of Gas Technology Research Bulletin Series, No. 9 'Selection of Oils for Carburetted Water Gas.' and No. 12, 'Selection of Oils for High B.Th.U. Oil Gas.' Both are co-authored by E. S. Pettyjohn, the Institute's Director, and H. R. Linden, Assistant Research Director. The projects on which these publications are based were sponsored by the Gas Production Research Committee under the P.A.R. Plan of the American Gas Association.

The bulletins present data on the relationships of the physical and chemical characteristics of petroleum fractions, and of the operating variables, with the enriching values and with the qualities and quantities of the gaseous and liquid products. For the more common gas-making oils, these data are given in graphic as well as tabular form. Nomographs and equations included in the bulletins permit accurate calculations of these values for any oil, and indicate the operating variable most suitable for the selected oil and most favourable distribution between gaseous and liquid products.

Estimates of enriching value and oil gas yields, arrived at by the methods outlined, were compared with results obtained in plant operation and were found to be in good agreement, demonstrating the reliability of the procedures.

Peterlee New Town

SEVENTY-FIVE per cent. of the tenants in the new Durham town of Peterlee, where 500 houses have already been built, chose gas for cooking, Mr. F. L. Scaife, Stockton Divisional General Manager, told the Stockton Consumer Committee at a recent meeting. It was estimated that by 1962 there would be a population of 20,000 and by 1970, 30,000. The housing was developing rapidly and a gas supply was provided to all houses.

Work in the division was proceeding satisfactorily and in spite of material shortages it had been possible to keep abreast of the requirements for the many major housing developments in the area and gas cookers are being installed in most cases.

So far as the Stockton—Hartlepool link was concerned, satisfactory progress was being made in the laying of the 12 in. main and it was hoped that utilisation would be possible before the end of the summer. Mr. Scaife pointed out that the scheme would lead to distinct economies. If there was a major breakdown at either works gas could be taken from Hartlepool or Stockton instead of bringing expensive water gas manufacturing plant into operation.

Mr. Scaife stated that the Power Gas Corporation was puting in a new water gas plant at No. 2 works at Hartlepool. The gas supply there was now well safeguarded.

Training of the Gas Engineer

By A. E. HAFFNER, Ph.D., M.I.Chem.E., M.Inst. Gas E., F. Inst. F.,
North Thames Gas Board

From an Address as Chairman of the London and Southern Section of the Institution of Gas Engineers

THE present membership of the Institution of Gas Engineers is 3,000 and if it is considered that a young man becomes a chartered gas engineer at the age of 30 and he remains one until 60, this membership will be maintained at this level if there are 100 new members per annum. Actually the curve of membership is still rising strongly at about 7% per annum, and consequently, in future, more than 100 members will be needed each year. Wastage must also be taken into account, and the increasing gas consumption will also lead to increased demand for gas engineers. After trying to give weight to these several factors, it may be useful to regard an annual intake of 120 as the total requirement of gas engineers into the industry, and would include all those required for gas manufacture and distribution, contractors engaged on plant construction, gas appliance development and production, and to some degree those engaged in research.

These 120 can be taken in at many levels of maturity, but they are required in the teeth of fierce competition from an expanding oil industry, a growing chemical industry, other nationalised industries, and fascinating new industries involving plastics, electronics, etc., which appear to younger men to give greater scope.

As a rough basis of estimation, it is considered that the 120 technical entrants consist of 30 graduates and 90 who have entered the industry at an earlier stage. From an inadequate supply of scientists and technologists must be attracted the 30 graduates that the gas industry needs each year.

As for the 90 who enter the gas industry at an earlier stage, the records of the Institution of Gas Engineers Education Scheme provide valuable information. Taking the Higher Grade Certificate only as a criterion, since this conferred corporate membership it appears that the average annual number of successful candidates since the inception of the scheme has been 49 in Gas Engineering Manufacture and 36 in Gas Engineering Supply.

Successful Candidates for Higher Grade Certificate.	Gas Engineering Manufacture	Gas Engineering Supply	Total
Average since 1930	49	36	85
Average over five pre-war years 1934-38	64	26	90
Average over years 1941-45 ..	22	10	32
Average over five post-war years 1947-51	56	44	100

Analysis of the results into pre-war, wartime, and post-war periods shows that the post-war output has been reduced in the case of Manufacture and increased in the case of Supply. As an index of future supply of engineers under the new Examination Scheme, the total of 100 of successful candidates in Gas Manufacture and Gas Supply Higher Grade Certificate during 1947-51 needs to be considerably scaled down to, say, 80. There is, therefore, a discrepancy between supply and demand in our industry, and this is likely to become greater in future years.

It can be concluded that there is generally a shortage of scientists and technologists in many industries, that there is likely to be increasing competition in the demands for suitable young men, and that the gas industry needs to be very careful about the presentation of its technical story to the outside world and particularly to educational establishments, and most painstaking in its training schemes for pupils.

Presentation of Technical Aspects

What causes a gas engineer to select his profession? In a few cases they are born on a gasworks, the sons of successful gas engineers and very often both their maternal and paternal grandfathers have been successful gas engineers. Accidentally, therefore, selective breeding, such as is usually only devoted to racehorses and pedigree livestock, has been applied to human beings, and it has been observed that at an early age such children develop a precocious familiarity with gasworks plant and machinery, and an understanding of workmen. This stands them in good stead in later years when they decide (or perhaps agree) to become gas engineers themselves, and usually they become very successful ones in tune with their own generation.

It may be that a youngster becomes interested in gas engineering from a school visit to a neighbouring gasworks. There are now about 4,000 school visits per year, in the North Thames Gas Board, and these visits are often supplemented by excellent films telling direct or indirect stories of the industry. Although such visits and films are intended for general instruction and entertainment of future citizens, it is possible that a few boys are thereby attracted into the industry. At school, too, careers masters, helped by the I.G.E. publication 'Careers in the Gas Industry,' may present the facts in such a way that boys make the decision to become gas engineers.

The Schoolboys' Exhibition has gradually widened its primary function of pure entertainment and instruction of the intelligent schoolboy (and his parents) into a system of enticing the youngsters' interest in future employment in the nationalised industries, the Services, etc. It is essential for the gas industry to maintain its high degree of effectiveness in this sphere.

Recently the Gas Council has made it clear that the gas industry is willing to welcome students on vacation employment, and last year many students took advantage of the scheme. It is to be hoped that this general invitation to universities by the Gas Council will not use up all our vacation employment capacity and lead to an exclusion of foreign students who have been spending summer vacations for many years in the gas industry (and many others) as part of an international exchange scheme operated by the Imperial College on behalf of all the British universities.

Training Schemes

There are several ways of entering the gas industry on the engineering side:—

(1) By means of an apprenticeship by direct entry from a primary or technical school.

(2) By means of an apprenticeship or pupilship by direct entry from a secondary, grammar, or public school.

(3) By means of a pupilship direct from the university.

(4) From other industries, including the Merchant Navy.

In the North Thames Gas Board there are no longer any special apprentice schemes whereby a youth gained experience in several trade departments to prepare him for a subsequent career as draughtsman or engineer. Apprenticeships are, however, arranged in each trade and apprentices are given an opportunity at the age of 18 to be considered for staff pupilships, particularly in the distribution and commercial departments.

There are many examples of youths leaving school at the secondary stage and entering the chemical department on the research or works side. Facilities are given for further education, including the Milne-Watson scholarship, and many take degrees in chemistry, chemical engineering, or the examinations of the Institution of Gas Engineers. Occasionally some of these are given an opportunity of transferring to the engineering or production side.

Another line of advance for the exceptional man is workman, foreman, shift superintendent, and so on. There are a number of examples of this sort of progress.

At the end of the war, a number of people with these various background experiences was organised into a shift superintendent system to be applied to all but the smallest works of the former Gas Light and Coke Company. To assist them to acquire a more advanced knowledge of gas production, etc., a course of lectures was given them by specialist members of the staff qualified to instruct on gas production and utilisation, gas distribution, steam and power production, and accident prevention.

Pupilships

The Gas Council has issued a memorandum giving most helpful guidance to those concerned with the responsibilities of pupilships. It has been customary in the last five years for the Gas Light and Coke Company and the North Thames Gas Board to recruit pupils from universities who are already in possession of a degree in engineering, gas engineering, chemical engineering, chemistry, etc. It would seem that the scientific subject actually studied for their degree is not of first importance. Because of intensive study of one group of subjects, a students' mind is trained and receptive of ideas in another group.

The selection of pupils is regarded with very great importance, and they are interviewed carefully by the Chief Engineer, and before they decide to enter the industry they are given an opportunity to spend a day or more on a works to ensure that their decision is based upon a sound appreciation of the conditions and customs of our industry. The pupilship consists of a three-year period. The first half of this period is spent on about four different works deliberately chosen to provide experience of a wider variety of gas-producing plant. To have the works in order of increasing size is considered to be an advantage, but it is not always possible to arrange. Normally there is only one pupil on one works at a time so that he becomes more readily assimilated into the technical team. The earliest part of the period is one of acclimitisation and adjustment from the academic atmosphere to the industrial, with its different tempo, language, customs, and aims. At the university the student is able to measure his progress by the consecutive examinations, but there is no such help in industry. His first reaction may well be that his scientific training can only confirm the design and operation of plant which have been based largely on practical experience, and there appears to be no innovation which he can introduce to justify his scientific approach. If he proceeds warily, he will see his opportunity and the scientific outlook enters into his decisions far more often than he may realise.

The Team

It is during this period that he learns to become a member of a team and to play his part in the good humoured fellowship of it. He also discovers that all workmen are not alike and among the men he gets to know are those with long service, proud that their families have been associated with the gasworks for many generations, and looking forward perhaps to their sons taking up apprenticeships in the industry. But there are also the restless souls who never look forward more than a day ahead. The pupil may be tempted to reach the conclusion that all the 'characters,' the unusual personalities, those in command of the most picturesque language, become segregated in the gasworks and the outside world is relatively full of colourless persons. It assists towards a closer knowledge of these personalities if the staff can join the men in their games and social occasions, and the sporting engineer who can achieve a hat trick when playing cricket for or against the works is likely to have good working relations as well.

The pupils would begin to chafe under the system of acting only as observers if they were not given small jobs of increasing responsibility, but the first real testing time comes when they start the second half of their pupilship and they assume the functions of shift superintendent. All that they have learnt during their daytime observations now stands them in good stead, when they take over direct responsibility for a works at hours when daytime resources are not available. Their confidence is no doubt increased by the knowledge that there is a standby system of engineers ready to back them up, but as experience grows they find themselves growing steadily more self-reliant.

It is during this period that they learn the vital value of good foremen and appreciate that the foreman must never have any of his authority diminished by by-passing in either direction. If this point of view has not been reached, then the pupilship has been a failure.

It is when the pupil becomes an assistant engineer in charge of his own plant, and when his name and reputation are identified with the plant, that he adds other criteria to that of maintaining gas output and learns to pay more attention to thermal efficiency, long sighted maintenance, and leadership based on just discipline, sound organisation, and clean and safe conditions of work. By that time, he has grown to respect the traditions of the industry and learnt to conform with customs and practice, but it would be a sheer waste of his potentialities if he lost confidence in the application of scientific method, or if his imagination were dimmed and he became content with methods of operation and plant design which had hitherto given apparent satisfaction.

Training for Management

Very few gas engineers find that their duties are confined to purely technical matters without having some management function. With most, the management function is predominant. Hitherto training in management has been largely accidental. There has been a mounting interest in this subject, particularly in post-war years. The Chairman of the Gas Council has expressed his approval of such training, and it is satisfying to note that already a representative from the Wales Board has passed through the Administrative Staff College at Henley, and more from the gas industry are to follow.

The greatest distrust of training for management appears to be directed against the application of psychology to industrial human relations, especially if the teachers are but remotely connected with industry. But there can scarcely be any objection to imparting a knowledge of those subjects which are of direct application to the young engineer's vocation while he is working in direct contact with men and under and within a team of good managers.

Great pains are taken to teach science and technology. Young pupils, especially those familiar with Service courses, have indicated how much they would benefit from a course dealing with even elementary costing and accounting, trade union organisation, wages structure and incentives, accident prevention, industrial law, and industrial medicine.

A very sound syllabus is that of Section C of the Institution of Mechanical Engineers. This syllabus has no more than half the scope of the Intermediate Certificates in Management Studies. It takes two evenings per week for one year of study and many courses are established for this purpose. The course commends itself and it is to be hoped that the Institution of Gas Engineers will sponsor and administer an examination system for such a course. Students could take advantage of existing classes, but it would be unwise to press for the inclusion of this subject into the Associate Membership curriculum, which is already very full and which at this transition stage should be left undisturbed in its development.

The most appropriate method of including the subject of management studies in the Institution of Gas Engineers control would appear to be as a supplementary endorsement subject.

Present-Day Distribution Procedure

By R. MARSH, Assoc.M.Inst.Gas E.,

Engineer and Contract Manager, E. E. Jeavons & Co., Ltd.

Paper to the South Western Section, Institution of Gas Engineers

ON all large integration schemes an exacting survey of all the possible routes is essential to determine the most favourable route, having in mind the cost of laying, the life of the main, and the utilisation of the main for consumers *en route.*

To determine the cost of laying the following must be ascertained: (i) Surfaces to be encountered (field, roadway, footpaths, etc.); (ii) wayleaves; (iii) obstructions in ground; (iv) composition of subsoil; (v) average thickness of road surfaces; (vi) natural water levels; (vii) special crossings (rivers, railways, etc.); and (viii) pipe delivery and storage space *en route.*

It is desirable that the total length of each type of surface is known, also that the individual surface lengths and their locality are taken into account. For example, the total yardage in tarmac roads may be, say, 6,000 yards. If this yardage is in one or two lengths it can be excavated at a lower rate than if it is divided into 12 separate lengths, for whereas in the first case road breaking plant can be fully and continuously utilised, in the latter instance some, if not all, of the plant will be standing idle for considerable periods, and will also have to be transported continually from section to section.

Wayleaves

The majority of wayleaves deal with farm land. In the past it was a case of a local undertaking having an agreement with a local landowner, but since vesting date a different attitude has been apparent. Most farmers and landowners are somewhat suspicious and even resentful of any intrusion by officials of any nationalised industry, so that when a representative of the industry approaches the landowner concerning a wayleave, the goodwill which existed in the past may not now exist, and the landowner is out to gain all he can in compensation, etc.

From a mainlayer's point of view the ideal time for laying mains in fields is from May to September; this period, however, is also most vital for the farmers, and therefore in most cases the main will have to be laid in fields during the winter months unless substantial compensation is to be paid for loss of crops and grazing.

The route through fields should be as near to the roadway as possible to facilitate the handling of the pipes to the trench, the removal of the surplus, and the entry and removal of mechanical plant. An easement 10 yards wide should be the standard working space. Where a mechanical excavator is used it is advisable to travel the machine around banks and hedges sooner than cut through them, not only for financial reasons but because the average landowner will prefer it. Where possible it should be agreed that the top foot of soil and turf should not be replaced for a period not less than two weeks after the partial filling-in of the trench, for as work is likely to be carried out in winter the ground will be wet, and in these conditions it is advisable not to ram the trench as solidly as one would a road, or the natural drainage of the field will be upset. When the final reinstatement of the trench is made, the surface level of the trench can be the same as that of the field, thus causing no inconvenience to the landowner as far as ploughing and mowing are concerned.

Generally speaking, in roadways, information can be gained from local and other authorities concerned regarding the depth, size, and location of existing pipelines, etc. This information will give a good idea of the depth required and the position in the road of the future main. In fields, however, although most culverts can be located beforehand, the position and depth of land drains cannot be ascertained, and often these land drains will cause a main to be laid at extra depth to avoid the use of additional syphons.

Composition of Subsoil

This information will above all things determine the rate of excavation and the plant to be used. Information can be obtained from geological maps, but I find that, where it is possible, a more detailed report can be gained from local sources, and time spent in gaining this information is well worth while. It is an advantage to trial-hole a route if information cannot be gained in other ways.

Road surfaces are often deceptive. Twelve inches of road metal is allowed for in tenders unless otherwise stated, but often a road has been rebuilt and in section may consist of three separate road surfaces where super-elevation has occurred. This will necessitate extra plant costs and will greatly hamper the progress of the mainlaying. From a contractor's point of view this slowing down of progress can ruin a contract, as the extras allowed will only cover the cost of extra plant and labour, and will not fully compensate for laying less than the proposed contract yardage.

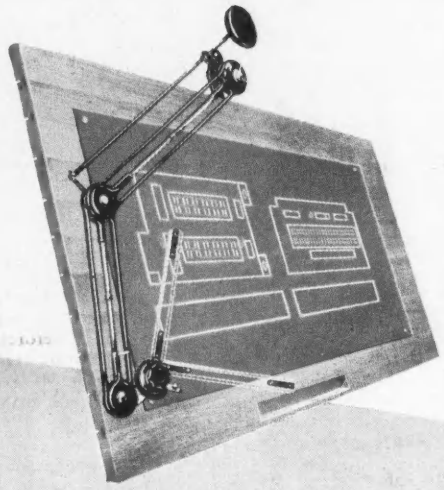
These must be known so that a good idea may be obtained of the amount of pumping which will be required and so that sections liable to seasonal flooding can be completed at a time when this should not occur.

On a recent contract a main was laid in a grass verge of a country lane which was practically level, well above a river situated approximately one mile away and running parallel. A railway line also ran between the river and the road. The surrounding fields appeared well drained and were not subject to flooding. When the trench was excavated, however, an alluvial deposit of silt and compressed gravel was discovered below the depth of 2 ft. This deposit varied in depth and beneath it was a layer of hard clay. The gravel therefore formed a natural land drain, and although it was well above the existing river level it had clearly been a river bed at some time. As this deposit and clay were excavated the trench formed a drainage sump for the whole of the surrounding area, making the laying of the main difficult and necessitating continual pumping throughout the section. These conditions continued for approximately 1½ miles and then, although the relative levels of the road and river were the same, the alluvial deposit and the clay base ceased, giving way to a light sandy soil which was perfectly dry to a depth of 5 ft.

Special Crossings

These consist mainly of river and canal crossings and railway crossings. For river crossings I advise that wherever possible the main is laid over the river. Not only does this allow for a periodic inspection, but it also ensures that future repairs or even renewal can be carried out at much less cost, and *in most cases* the initial cost of laying is also less than for an under-water crossing.

For railway crossings which have to be laid under the permanent way, it is advisable to fit either a steel or a concrete tube of sufficient dimensions to allow for future



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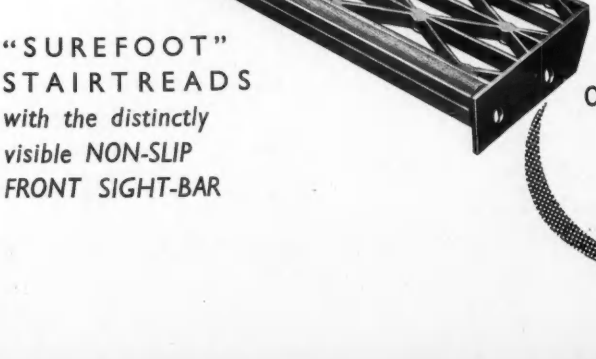

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enlarging of the main. When this is done, should it prove necessary for any reason to remove the existing main it is a comparatively easy matter to withdraw and relay the main.

In most cases bridge attachments and river and rail crossings are not carried out at a contract figure, since a fixed charge would necessarily be high in order to cover all the possible difficulties. If, however, a plan is submitted of a proposed crossing a very close approximation of the day-work involved can be obtained, but only if the contractor is allowed to supervise and carry out the job, entirely without interference. It should be realised that, although the contractor is handling the work, the skilled men employed by reputable contractors to the industry have in most cases had years of experience in all types of such crossings, and throughout these years have devised plans for tackling them which are likely to be unfamiliar to the board's engineers; therefore, in order to gain from this experience, it is essential that, having been given the plan and the requirements for the job concerned, and to cut the cost to the lowest possible figure, complete freedom on the practical side be given.

In present circumstances the pipe delivery is dependent on so many factors beyond the control of both the gas industry and the pipe manufacturers that instead of the rate of delivery being planned to suit the rate of laying, the reverse applies unless a substantial stack of pipes can be built up before work is commenced. In either case starting dates tend to be controlled by pipe manufacturers at the present time.

A well planned system of pipe storage will reduce laying costs, and the ideal is to store pipes *en route* so that the minimum of pipe handling is involved, 100 yards being the maximum haul. Unfortunately, this is not possible in many cases, and where the pipe stocks are such that the haulage is excessive a pneumatic-tyred mechanical shovel, preferably with hydraulic lift, will generally prove to be the most economical means of haulage.

Type of Gang to be Used

The length of the main, the surfaces to be encountered, the subsoil, the width of roads, and the contours of the fields, etc., will determine the degree of mechanisation which can be economically employed, for it is vital that all plant is used to the greatest advantage and is continuously utilised while on site, bearing in mind that idle plant is a very costly non-productive item, because of hire or depreciation charges.

Mechanical plant likely to be required comprises: (i) Mobile air compressors (for road-breaking and/or air testing; (ii) trench excavators; (iii) crane or mechanical shovel; (iv) calf-dozer; (v) bomb rammers; (vi) vibrating roller; (vii) transport; (viii) traffic control lights.

On tarmac surfaces having up to 9 in. of hardcore a two-tool compressor should be adequate to break the road surface in front of an excavator for a trench up to 24 in. in width.

On roads having pitching and/or hardcore in excess of 9 in. two two-tool compressors will be required, and in exceptional circumstances three-tool compressors will prove to be more economical, since two of these machines can cope with the work of three two-tool machines. The compressors should be sufficient at all times to ensure that the excavator is not held up by them.

The life of the compressor will be greatly increased by the use of wedges or jacks to keep the machine level under all working conditions.

Excavators

Trench excavators are of the multiple bucket type and the single bucket type. The multiple bucket excavator will cut a better trench and requires less working width than the single bucket type. The output of these machines is higher, but they are, of course, a single purpose machine for track excavation only. A fact which must be borne in mind when considering the output of these machines under favourable conditions is that it is useless to employ a machine with a phenomenal output if the pipes can only be laid and back-filled at a fraction of this output.

The single bucket back-acting excavator can be used for various purposes besides excavating. It can be used as a crane for unloading and laying pipes, and can also be used for back-filling and loading of surplus soil. Although the excavating output is lower than that of the multi-bucket type, this machine will excavate harder subsoils. Its great disadvantage is that it requires a comparatively wide area in which to work.

Various types of mobile cranes are now on the market, but as these machines are primarily a one purpose machine they can only be utilised economically on large diameter pipes, which need the use of such machines.

Mechanical shovels are most useful as they can be used for various purposes such as: A crane for unloading, transporting, laying, and stringing out pipes; as a shovel for back-filling and loading surplus and as a tractor for haulage purposes. The use of machines having high-lift hydraulic power as against that of a winch for the raising and lowering of the bucket is a great advantage, particularly when the machine is used as a crane as the operator has fingertip control at all times.

Calfdozers can only be used when the subsoil is of an even texture. If used correctly the trench can be backfilled to comply with the recognised practice of mainlaying requirements. The pipe should be covered to a depth of 9 in. by hand. The advantage of this machine is that it can greatly reduce the labour costs for backfilling and the men it frees from this task can be usefully employed elsewhere.

Bomb rammers are now universally used for ramming the backfilled trenches, a task they perform perfectly, affording a considerable saving in time when compared with hand ramming.

The vibrating action of the comparatively light roller enables it to perform all the tasks previously allotted to the heavy road roller. It can also be used to great advantage in rolling the trench in fields and verges after the turf has been relaid, and also for rolling tarmac for temporary or permanent reinstatement.

Transport

The amount of transport used will depend on the volume of surplus soil to be moved, and mechanical loading should speed up the disposal of this surplus. Transport should not be allocated as a piece of equipment to any gang, but should be utilised between gangs to ensure that it is at all times fully and economically used. It often proves advantageous to hire transport locally for moving surplus, as the vehicle is only hired when work is available for it, whereas a vehicle which is allocated to a contract is charged full time, although it cannot always be fully employed.

Automatic traffic light signals are powered with a small petrol generator, or can be coupled direct to a mains electricity supply. The use of the latter is preferable, as it cuts out the use of the petrol engine, therefore the set can be operated continuously from the time it is switched on. When the petrol engine is used for continuous service the engine will require decarbonising every 300 hours. The sets are entirely automatic; the time switches can be regulated to suit the length of the excavated trench, and they cut out the human element which is responsible for the periodic chaos which takes place when flags or 'Stop' and 'Go' boards are used.

A mechanically equipped gang will, of course, include many specialists, and a ganger with a good 'knowledge' of the general capabilities of the plant is essential. The number of men employed will depend on the size of the main to be laid and the proposed output, but an average gang will comprise a ganger, a pipelayer, a jointer, a watchman, a trench excavator driver, a banksman, and 10 labourers.

The crane or mechanical shovel driver would not be employed full time with any one gang, but operate on two or more. Some of the labourers would be semi-skilled men, operating as required the vibrating roller, calfdozer, bomb rammers, and compressors.

The efficiency of the hand gang has deteriorated considerably in recent years. Despite wage increases there has been a noticeable decrease in output per man. The scarcity of labour has also affected output, as there has not been the free choice of the type of man to be employed in many cases. I consider, however, that one of the major causes in the drop in output per man is the rationing of foodstuffs. While the present-day balanced diet may be enough for a sedentary worker, it cannot possibly be considered sufficient for a heavy manual labourer, and I feel sure that when sufficient food is available, of a suitable standard, output per man will inevitably show an increase.

Backfilling, unloading of pipes, and the laying out of pipes and specials can be handled easily and more efficiently by a mechanical shovel. This ensures that the gang is fully engaged on excavating, laying, and backfilling.

Testing

Much controversy has recently arisen as to the type of apparatus to be used for recording high pressure tests, and the degree of accuracy expected. The two instruments invariably used have been the Bourdon gauge and a clock-recorder. Recently the South Eastern Gas Board's mechanical testing apparatus has been used for high pressure tests.

Of the three instruments, I prefer the clock recorder of the 'Bristol' type. The manufacturers of this instrument have been approached regarding the production of a recorder to give a reading from 45 lb. to 55 lb., thus magnifying the chart as recorded by the present available instruments. The advantages of this instrument are that a record is kept of the whole period of the test, and when a leak does occur it will record the rate and period of the leakage. This information is most useful as it will give a good idea of the type of leak experienced. For instance, a split pipe will show a greater leakage at high pressure and will in many cases cease to occur at around the 20 lb. per sq. in. mark, whereas a faulty joint is recorded as a comparatively steady leakage throughout the test period. The charts recorded also provide visible proof of all tests carried out.

DISCUSSION

The **Chairman,** Mr. J. H. Lowther, thanked Mr. Marsh for his paper.

Mr. F. W. Sansom (Exeter), speaking of wayleaves, took exception to the idea of landowners resenting intrusion by the nationalised bodies, in spite of the fact that landowners now felt that they had little option but to grant a wayleave to a nationalised body. The Post Office in very many areas had readily gained wayleaves, and in like manner, before the war, when electricity supplies began to be integrated, landowners in the same way offered no objection to the granting of wayleaves to the Electricity Authority in respect of overhead lines, and his experience was that they were offering little opposition to the Gas Board. They did quibble at the price, but they were generally able, after a little negotiation, to get the facilities they required. It was essential that they should not offer one price to one farmer, and another to someone else for any one main. They should treat them all alike, offer them a fair price, and stick to it. In regard to compensation, they had to appreciate the other man's point of view. It was not possible to lay all mains at the right season, and with the increasing use of wayleaves some of these mains had to be laid at a difficult time for the farmer; and if they destroyed or hindered a crop, they must undertake to pay for it, and to that end he would suggest that they on the distribution side needed to learn something regarding the farming industry and the worth of crops. In Exeter, they had found it necessary to get this information, and if a farmer saw they knew what was what, they got no 'phoney' claims, and he would be content with a fair assessment. They would, however, be faced with claims for compensation, and they would have to pay them. Mr. Marsh also referred to interference with the natural draining of the field. It was essential that on loose alluvial soils excessive ramming should be avoided. If a trench cut across a sloping field and was excessively rammed, a dam was set up across the natural draining, and in that field surface flooding would be caused. Existing land drains had to be looked out for, and it did need careful watching by the officials of the Gas Board, as it was so easy for a drain which had been removed to be overlooked. In regard to special crossings, where a river could be bridged in one span without central support, overhead crossings were best, but where some suspension or central support was necessary it was sometimes best to consider going underneath. There was a proprietary tubular bridge available which was of use in crossing streams. In regard to the calfdozer, while this was a very great labour saver, he thought the words which needed to be deeply underlined were 'if correctly used.' The vibrating roller was a machine which the Gas Board could examine with a view to using it for minor reinstatements. As to testing, many would be familiar with the Code of Practice issued by the Institution some 12 or 18 months ago, and he would personally, every time, use the South Eastern Gas Board's mains tester, provided the normal precautionary procedure in regard to recording equipment was carried out.

Mr. Marsh, in reply, suggested that if the calfdozer was used sensibly, there was no reason, if the sub-soil was of even texture, why one man could not fill in a trench, but the soil should not be replaced in one heap. Regarding the testing apparatus, he agreed that the South Eastern Gas Board's apparatus was correct. He agreed, too, with the use of recording equipment, but thought that no reputable contractor would attempt to 'work' a test. He also felt that the clock recording gauge was still the most satisfactory. If there was a leak, he wanted to know the time it occurred; and it saved much time and expense if he could immediately find the root of the trouble—for instance, whether it was a split pipe or a joint. In regard to wayleaves and his suggestion that farmers did not like the nationalised industries, while it might be true that farmers felt they must automatically grant the wayleave, he believed that some resisted quite strongly and were out for all they could get in the way of compensation. They were not so ready to agree the compensation or the cost of the wayleave purely with the engineer in charge, and were more likely to apply immediately to a land agent or solicitor. The goodwill which existed between some of the old undertakings and the local farmers was not as strong as it used to be.

Grant of Easement

Mr. A. R. Langford (Plymouth) said that, though arrangements might have been made with the owner for a grant of easement, it reverted back to the tenant who was the man to satisfy. It was not wise to consider wayleaves for mains of size 8 in. or above. If they took into account the costs of the grant of easement, legal fees, and compensation, they arrived at a figure somewhere in the region of 4s. 11½d. per yard at the moment, in addition to which there were extra expenses as they went along. This might apply only to counties such as Devon and Cornwall, but he had yet to be convinced that for mains of size 8 in. or above, wayleaves could be made to pay. He gave the following figures from a recent job just over 6,000 yards in length:—

Pence per yard for grant of easement ...	12.92d.
Cost of legal fees	4.99d.
Compensation per yard	41.35d.

After the contractor had left, although, of course, in his contract he was responsible for the upkeep of the trench, where a wayleave had been negotiated over a length of main it was necessary at times to send men many miles away to satisfy the tenant, and from his recent experience he would give careful attention to making use of grass verges, and finding out from various surveyors any improvement schemes proposed, and would negotiate to lay the mains in the improvement line. He would also consider laying mains in old highways or lanes. The figure of 4s. 11½d. was set against a figure of about 8s. 3d. per sq. yd. for reinstatement in a tarmacadam road. Specials were extra to this. In some cases the main might be 14 ft. deep, and this was an extra charge in a contract. He thought it was always advisable to have a member of the Board present when negotiating a grant of easement and arranging compensation with the tenants. Wherever possible he would arrange a lump sum to include everything such as compensation and damage to

crops, and get this agreed before the job was started. In regard to mechanical excavators, there had been no mention of the type of track. From his experience, he would not permit any mechanical plant and apparatus without a caterpillar track, and he would not allow any cranes with a fixed jib. Shovels had a fixed jib, and to manœuvre a pipe into the trench meant a good deal of work, and a 10 yd. width of wayleave might become 20 yd. There was mention of the shovel again for storage, but, of course, there again, it would have to be a swivel crane. Perhaps a back-acting type of excavator had several uses from the contractor's point of view, but for trench digging in mainlaying work it was not good. It was untidy and it took out a very poor trench compared with the continuous bucket type of excavator, which made a very good trench.

Mr. Marsh, in reply, said that from purely a contracting point of view, unless there was some substantial obstruction such as rock, he would prefer to lay any main in the road. In regard to excavator tracks, in his paper he mentioned two types of excavator, both of which had tracks. He would not advocate an untracked excavator for use in fields. Most cranes on the market today were on turntables. When speaking of shovels, he took it that Mr. Langford meant the ordinary tractor with the shovel on the front. When that was used for pipe distribution, it was possible for the tractor to run in one track at the side of the trench, but this was only possible when they had a turning device on the front of the tractor. With the use of a full length shovel, however, the pipe could be dropped on the side of the trench. In regard to trenches made by excavators, he agreed that the multi-bucket machine excavated a very good trench, but a single-bucket machine with an efficient operator would also excavate a good trench, although the progress would not be so great. Also the single bucket type of machine could be used as a crane. In soft ground this machine could lay its own carpet of sleepers. If they wanted to do this with a multi-bucket machine, they must either handle the sleepers by hand or use a crane in front of the machine.

Keep to the Route

Mr. J. W. Denton (Torquay) emphasised that the Board obtained the wayleave for placing the main in the trench, and for subsequent maintenance and they must make the contractor understand that he had no right to make free in the field, but must limit his activity to the route of the main only. Trenches cut across sloping fields interfered with the natural drainage of the land and could easily form a dam with subsequent water trouble. When there was this possibility drainage across the trench at intervals should be provided by some cheap method, either fireclay land drains or short pieces of old pipes. Particular care should be taken to ensure that the top soil was kept free from the less arable subsoil to prevent sterility of the soil for a short period after mainlaying. He agreed with Mr. Sansom that the South Eastern Gas Board's testing apparatus was desirable, but agreed, too, with Mr. Marsh that a recorder was also necessary. This would indicate any interference with the test and also would indicate if there was any leakage and the type of trouble which had developed, and would further facilitate the tracing and subsequent repair.

Mr. K. G. Pemberton (Torquay) commented that highway surveyors had a justifiable pride in their trunk roads, and large scale mainlaying could cause damage which could not be completely eliminated in a short period. Close consideration should therefore be given to surveyors' requests where practicable and economical. Damage to property should, if possible, be negotiated by the Board's representative, contractor's foreman, and claimant on site as soon as possible after mainlaying was completed, and should always be related to individual circumstances. In some cases the claimant would employ a land agent and surveyor, and apart from the additional cost involved, he had found them very fair. He felt that the figure of 10 yards to work an easement was on the high side; 5 yards was a better working figure, bearing in mind that many easements were close to a road boundary. Mechanical excavation was of doubtful value in South Devon or any hilly area. To comply with wayleave stipulations that top soil and subsoils were separated, a continuous bucket type excavator would need to cover all ground twice. The back-acting bucket type machine would obviate this difficulty, but in this climate excavators on private land were liable to bring about so many additional claims for damages that any saving over a hand gang would be difficult to achieve. Bridge crossings were individual problems where close collaboration was called for between Board officials, contractors, and manufacturers of the material to be used. As a general rule the manufacturers were bound to have more experience than either Board officials or contractors. Calfdozers enabled certain contractors to quote ridiculously low prices for laying water mains and this, in his experience, was because no ramming was carried out. It would be interesting to know how many bomb rammers should be used per calfdozer. In regard to mechanically equipped gangs, he would like to know the duties of a banksman.

Mr. Marsh said they could have one to two bomb rammers on a job to one calfdozer, but he thought that a maximum of three bomb rammers was all that could be employed with a calfdozer to fill in a trench properly. In regard to the 10 yard working width as opposed to 5 yards, he did not think 5 yards allowed much scope, and he would like to see a case where there was a trench with surplus soil to be filled up, and a lorry, where the whole lot could be kept within 5 yards. Referring to top soil, when using a multi-bucket machine only a foot of the top soil was moved; it had to cut and cut again, and the top soil had to be placed on one side and the subsoil on the other. Personally, he would prefer to have two men in front of the excavator to dig the first foot. The banksman was laid down by the Union—each multi-bucket machine must have a banksman. This applied only to the multi-bucket machine.

MINISTER'S APPEAL FOR SCRAP

MANAGING directors of 13,000 steel-consuming firms have been asked by Mr. Duncan Sandys, Minister of Supply, to support the drive for scrap metal. 'Industry,' he points out, 'is being gravely handicapped by the acute shortage of steel. This is restricting production, both for home consumption and for vitally needed exports, and is also holding up essential industrial development. The immediate cause of our difficulties is the fact that the steelmakers, who have the furnace capacity to make more steel, are short of one of their basic materials—scrap. If industry will make the effort to throw up more scrap quickly, it will get it back over the next few months in the form of more steel.

'I appeal to you to turn out at once any obsolete machinery or other unwanted ferrous material you may have in or around yours works. If you will get in touch with any scrap merchant or with the district scrap drive committee, they will arrange for collection and will pay for it at prices which are higher today than they have been for many years.'

Over 300,000 tons of additional scrap were collected within steelworks as a result of the drive last year and, this year, deliveries of scrap to steelworks from outside sources have been increased by over 3,000 tons per week.

BABCOCK AND WILCOX RESEARCH

BABCOCK & WILCOX, LTD., have recently brought into full operation a new research station situated near the main works at Renfrew. The main block is a two-storey building with a floor area of 22,000 sq. ft. Behind the main building is a combustion research building with a floor area of 5,000 sq. ft. Further single-storey buildings with a total floor area of 22,000 sq. ft. are being built as extensions to the laboratories. Remote from the main block is what was once a golf club house which, originally scheduled for demolition, has been retained and is used for temporary laboratory accommodation pending the building of the extensions. At present it houses pot furnaces and scaling test apparatus. In addition to the main research station, full-scale boiler research is carried out on a boiler with a capacity of 40,000 lb. per hr. at a pressure of 1,500 lb. per sq. in., situated in the main Renfrew works. Two other 450 lb. per sq. in. boilers with capacities of 40,000 and 60,000 lb. per hr. are available for special work when required. This plant is located in the works, so that the steam can be usefully employed. Research work requiring large quantities of steam must, therefore, be done in the works. Other activities (hot rupture testing machines and the electronics laboratory, etc.) carried on in the header factory were so located because the old research department was in this part of the works. All activities other than those requiring steam will eventually be concentrated at the new research station.

The total number of persons employed in the department is 205. In addition to general administration, the department is divided into six sections, each under the control of a section leader, the sections being: Chemical; fuel testing; mechanical testing; combustion research; engineering research and metallurgical.

LARGE SCALE DEMAND IN A LIGHT INDUSTRIAL AREA

By G. E. THOMAS,
Divisional Industrial Gas Engineer, Watford, Eastern Gas Board

Abstract of a paper to the Eastern Section of the Institution of Gas Engineers

THE paper, covering 60 foolscap folios, with 32 tables and 21 graphs, comprised a survey of the non-domestic load over a period of five years, 1946-1950, in the area of the former Watford and St. Albans Gas Company, which from vesting date formed the nucleus of the Watford division of the Eastern Gas Board.

Two important aspects which enabled the survey to be made in this form were consumer classification and load classification, in addition to which a census card system was operated whereby every consumer in the non-domestic categories was included and progress in all spheres of demand was recorded.

The tariff structure which brought into effect load classification was discontinued in April, 1951, as a consequence of which it has not been able to continue the survey for new consumers along similar lines up to the present date.

The tariff structure employed over the five year period under review necessitated separate metering and it was, therefore, possible to observe load characteristics for the various uses and classified demands. The author has not sought to justify promotional or discriminatory tariffs in any way, but has endeavoured to examine the resultant facts in as simplified form as possible without resort to complicated formulæ.

Consumer and Load Classification

Consumer classification is more or less in accordance with the Ministry of Fuel and Power return, with the exception that bread baking, which is normally included in the commercial category, has been given a place of honour in view of its increasing importance to the gas industry.

Details of the load classification by means of tariff are also shown, and indicate how demands in all consumer classes are separated and classified, for example, domestic consumers' normal requirements are separated from central heating and/or large scale hot water requirements via gas fired boilers. Similar conditions apply to commercial and bread baking consumers, and in the case of industrial consumers the demands for process, central heating, and catering are all separately metered.

The general trend of non-domestic sale in relation to total sale is shown in one graph, and broken down into the four classified spheres of demand in another. In these, and also in a third graph the figures depicted each quarter are consumptions for a complete year ending in that particular quarter and the graphs, therefore, illustrate progressive annual sales observed at quarterly intervals. An increase from 28.5% to 34.5% has been taken as a pointer to the planning of future needs of new development areas. Reference to this factor was made by M. A. Evetts in his paper 'Some Notes on Estimating the Gas Demand' (*Gas Journal*, April 25, 1951, p. 239) wherein it was stated that allowance had been made for parity between the non-domestic and domestic loads being achieved.

Support is lent to this contention by the fact that since the period covered by the survey and up till March, 1952, the ratio of non-domestic sale to total sale in the area under review increased to over 38%. This was to some extent due to the fact that industrial building, virtually dormant over the period under review, commenced at the end of 1950, and since that time some 10 new factories have been built in the area.

The implications of an increasing non-domestic load are not covered in the paper, but one cannot help feeling that such increase may lead to complete revision of outlook in future planning. A great deal must depend on the nature of such development and the character of the major constituent demands.

Space Heating

The extent to which the space heating load has developed is shown by increases of 200% in the domestic sphere, 110% in the commercial, 65% in industrial and 93.2% overall, and some reasons are put forward as to its popularity in light industrial premises. There are many schools of thought as to the usefulness of this load, and it is not the author's aim to influence opinion one way or the other, except to record his own personal experiences in dealing with industrial requirements.

One must not lose sight of the development in domestic central heating demand, in view of certain characteristics of that demand not so apparent in the industrial and commercial central heating loads.

The fairly considerable increase in the industrial process sphere has been encouraging, mainly from the standpoint of the increasing demand of established industries undertaking no building expansion programme, signifying that the industrial potential has far from reached saturation point.

The development of the bread baking load, while small in comparison with other loads, is consistent and in keeping with experiences general throughout the country. There is considerable evidence, however, of stiffening competition from oil, and this fuel must be taken as our chief competitor, and solid fuel is likely to lose ground in the future. Price factor is militating against further substantial increase. While the price of the loaf is under any form of control, relative fuel costs must exert considerable influence on future progress.

Seasonal variation is shown by quarterly consumptions which, for obvious reasons, do not indicate maximum variation, and by a process of elimination the overall effect of the various constituent loads making up the total non-domestic demand is ascertained. The extent of variation in the central heating load is very considerable, but it may need further explanation as to why any demand is experienced in the September quarter. This is dealt with further in an analysis of the load.

Loads and Load Values

Having illustrated the overall effect of the consttiuent loads making up the total non-domestic demand, the author has endeavoured to determine assessment of load qualities based against three main essentials, continuity, constancy, and consistency. Reasons are put forward as to why individual and collective loads fall short of this ideal, and consideration is given to a basis of assessing good load qualities. Reasons are put forward as to why the use of the term 'load factor' is avoided. Apart from these reasons, if load factor is to be measured against maximum day then further investigation is necessary into the daily behaviour of individual loads and their incidence of demand.

The basis of assessment of load qualities, or load values as the author calls them, has been taken as the relation to continuous operation at maximum rate of demand. This.

(*Concluded on p. 108*)

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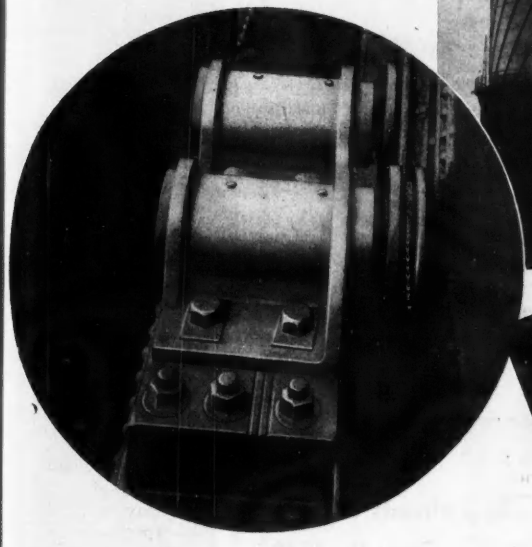

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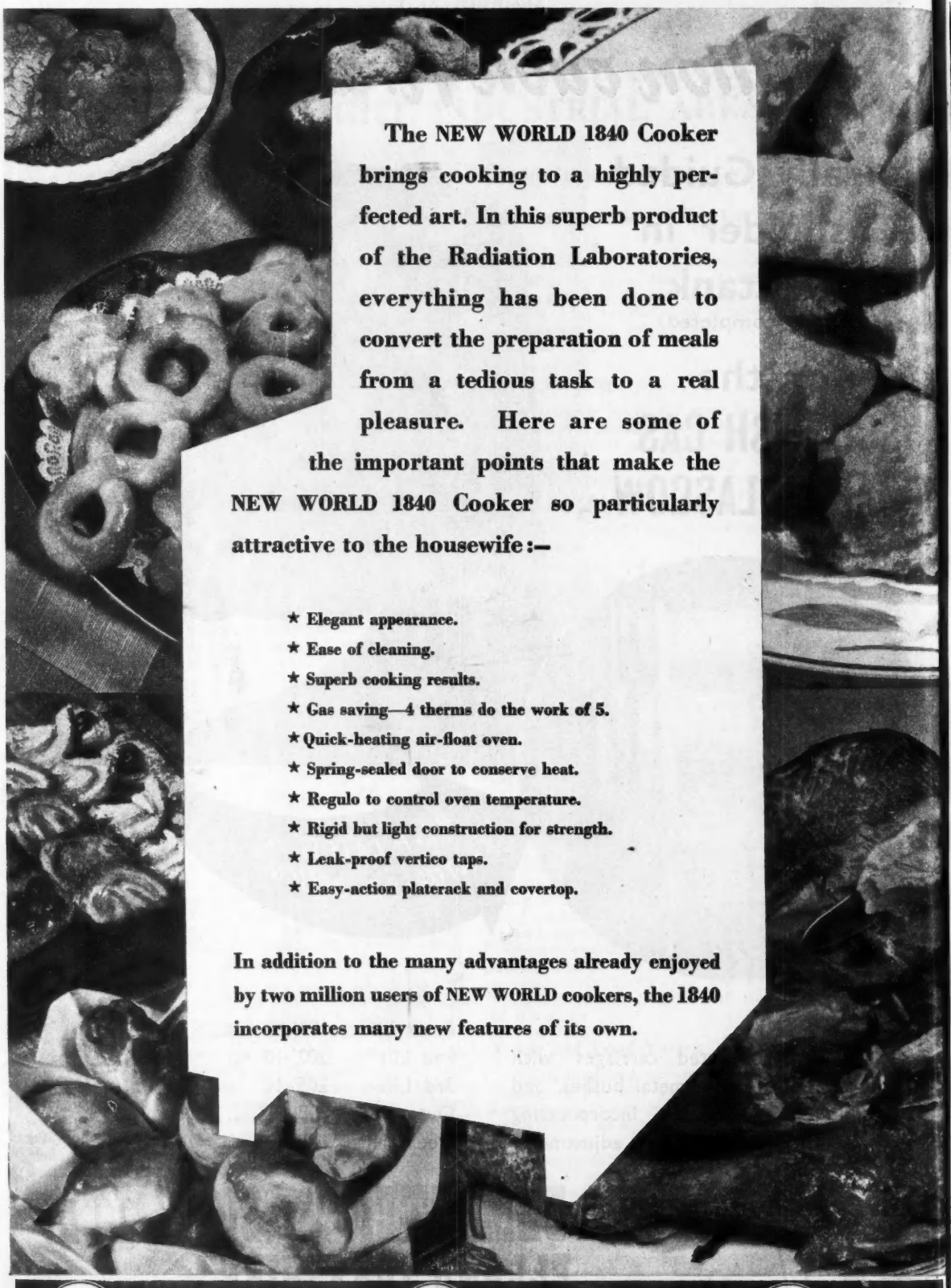

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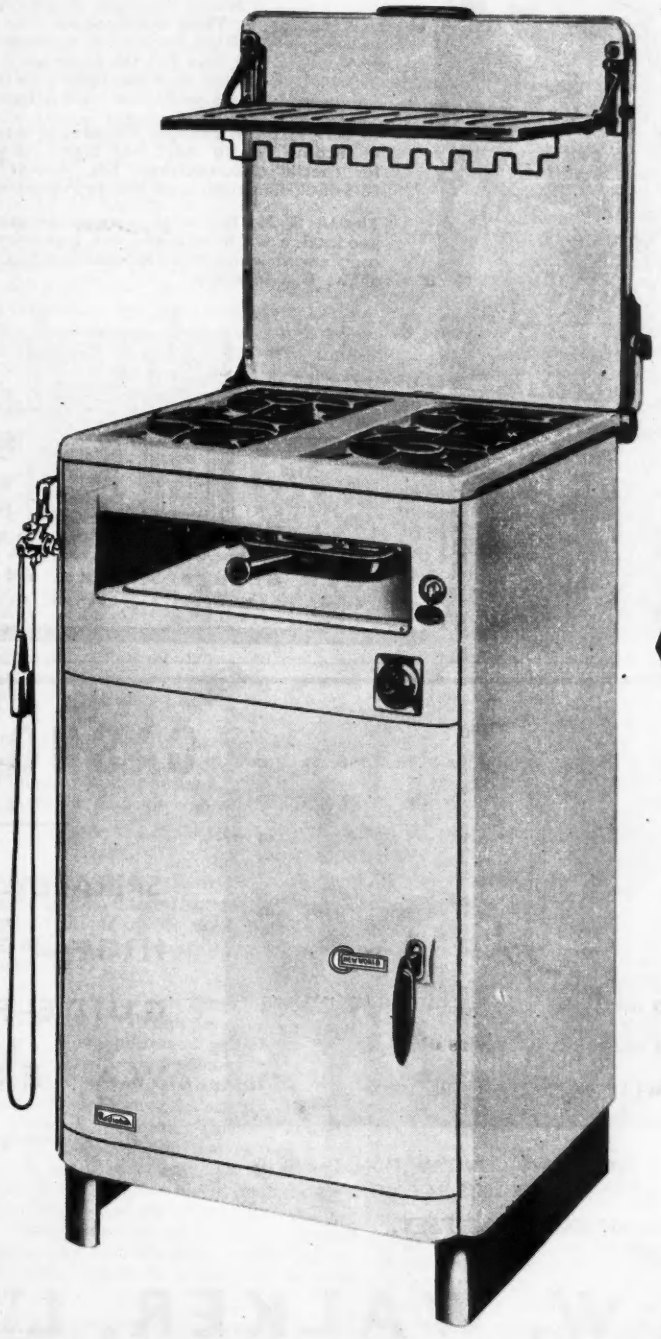

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The Gas Act and the Works Manager

By JOHN F. JACKSON,

Secretary, Northern Gas Board

From a Paper to the Northern Junior Gas Association

IN the course of 15 to 20 years or so the works manager as we knew him will have been forgotten. I must, of course, describe the person I have in mind as the works manager; he may well have been with a city or large town company undertaking, or, with certain minor functional alterations, gas engineer to a local authority. Our manager would have complete control of all aspects both commercial and engineering of an undertaking producing, say, 5 mill. therms annually, responsible to a board of directors for the efficient and satisfactory running of his works, offices, and staffs. Questions as to the development of any part of the circumscribed area would be his concern and the problems of distribution were dependent on his decisions. In addition to his many other duties this versatile person was assumed to have a good working knowledge of accountancy and law, be able to sell his residuals on good terms, acquire any coke oven gas that was likely to be available adjacent to or within his area, and in the remainder of his time settle hire or hire purchase terms for apparatus, do a modest bit of research work on some pet aspect of gas production or distribution, and have due regard to the welfare of his employees in all branches of the business—and, with a thought to the future, consider the training of new entrants and the provision of some kind of pension arrangements.

It might seem a little surprising to the stranger, but such a system worked—no doubt with creakings in certain departments and uneconomical aspects in others. As is well known the larger undertakings had reserves of knowledge not available to the smaller concerns, and, over all, there were the associations where advice and assistance could be obtained—headed by the British Gas Council. In the generality of cases the gas engineer became *ipso facto* the administrator, with the result that the engineering aspects of the position were in many instances submerged in the many other duties he had to perform—to the detriment, in my view, of both branches.

A Contrast

My main purpose will be to contrast the position of such a manager with his post-vesting counterpart and to draw your attention to the general provisions of the Act, the gas supply code, and such regulations as are of interest to you in completing your knowledge of the subject.

What I say are my own views formed over an experience of some 20 years in the industry. Except in the larger companies and municipalities, where adequate specialist support was given or made available on the professional sides, such as accountancy, engineering, and law, no one man, however good, could properly cope with an expanding industry built round what had been mainly a parochial system. This was exemplified only too clearly in the gas legislation that existed, which regarded each undertaking as a watertight entity and made normal expansion, whether geographically or financially, a matter for Parliamentary sanction and control with its surrounding opportunities for local authorities and other interested parties to petition against any parliamentary proceedings in an endeavour to secure some benefit to which they believed themselves entitled.

Such a system resulted in a number of instances of retarded development, with a tendency to deprive undertakings of the most modern engineering plant and to the existence of a confusion of tariff principles. There were other aspects, too, that were, if not neglected, at the best only prosecuted with a token strength. I have in mind, consumer service, the availability of the purchase of apparatus by means of hire purchase, the elementary steps in the training of new entrants, and the slow awakening to the real welfare needs of employees. Not all managers had heard of the Factories Acts and understood their full implications. A rather harsh indictment? The facts did exist, and I always except the more progressive and certain of the larger undertakings.

The development of the supply in a portion of the territory controlled by our manager is not now a matter for his decision—subject to what his board or committee may have felt—but is part of a larger issue. When a decision has been reached by the board it will be communicated to him. He cannot make the quantity of coke he might wish, to suit the economy of his own works, but will be informed by his immediate chief that so many tons of his stock will be delivered to a particular ship or place—or even that he must gasify all his coke. The disposal of other by-products is determined for him, at prices over which he has little or no control. Each week, and in some cases each day, notification will be received as to the quantity of gas he is to make in the plant under his control and when that gas has left the works his responsibility will have ended, for the distribution will be undertaken by another engineer whose special function it will be. Any showrooms previously under his direct control will now be operating on arrangements made by his controlling board, the principles of sale or hire purchase and normal hiring will have been settled upon an area basis. It may well be that his works took a coke oven gas supply upon terms which he had negotiated or in which he had been a most interested party. Any renewal or variation of the arrangements may be completed without his assistance. In earlier days he may have been instrumental in originating and applying certain principles affecting the welfare, health, and safety of the men under his control and arranging a course of training and education for the intake of new personnel. These particular aspects will now most probably be the concern of a special officer, and in some boards of two officers. Then our imaginary manager may have been pursuing a certain line of research work. It can only continue if the Gas Council and his particular board approve.

All Boundaries Gone

The remaining points in this catalogue of changes are possibly of advantage to him. The former area of supply of his unit is now of no consequence; all the boundaries have gone. He has no financial policy as such to worry him. Once a programme of work is approved, the funds to cover the cost will be provided by his board. He has no board of directors or municipal committee to trouble him and no annual report to make to his directors and shareholders—and in exceptional cases he can now acquire land by compulsory purchase.

So we see that, while a number of functions have been taken away from what used to be his normal work there are compensating advantages; and I need only touch briefly on them in order to complete the overall picture. The accountancy side will be almost completely taken away and there will be no direct connection with any income tax, rating, and legal problems. Many of you will no doubt feel this is all to the good. There is one important addition, however. The gas consultative councils have established consumer committees in the major centres of population and these bodies may well call for information on some production or distribution problem.

These are considerable changes and make immense alterations in the practice and procedure of the older type of manager—not to his detriment but rather to his advantage—by taking away some of the possibly irritating functions with which he

was formerly troubled, and allowing him to devote his professional skill and energy to the main purpose of gas engineering and in some cases also of distribution.

Area boards as such are not profit making concerns in the generally accepted sense of that term. Boards have to maintain their revenues at such a figure as will, over a short period of years, balance their outgoings, but the real criterion of efficiency must always be the overall gas charge to consumers coupled with a high degree of service and freedom from distribution difficulties. The ability to obtain capital moneys on more advantageous terms—due to Treasury backing—than the ordinary industrial concern is a valuable improvement in our position, although the formation of a Central Guarantee Fund and the sterilisation of a substantial sum of money as a corollary to the Treasury guarantee behind British Gas Stock may appear to some to be too rigid a method of dealing with the principles involved.

Among the most important changes of all the many effected by the Act, none takes precedence so far as the consumer is concerned over those relating to gas supply. It was the practice for each individual undertaking to fix its prices on a purely parochial basis and to determine its methods of charge in relation to circumstances as affecting the undertaking. As a consequence, the policies of directors and gas committees varied as between adjoining supply areas. One concern might have a long term coke oven gas contract in operation, another, with adequate capital at its command, could undertake extensions possibly on more favourable terms than its neighbour, resulting in a plethora of tariffs all differing in one or more essentials. I am not suggesting that any course other than that which was taken could have been adopted, and naturally the then managers were much involved. Managers as such are not now concerned with the methods of charge and tariffs, apart from their practical application to the area under their control. The larger issues are settled by the area board with the broad principles of unification in mind and the spreading over a wider area of what had previously been purely local as distinct from geographical circumstances. Where there exist special considerations such as an unusually heavy load for industrial purposes, or a load with an all-the-year-round basis and 'off peak' in character—the board will have settled the terms of an agreement in such cases, thus freeing the manager from personal concern in the matter.

It seems to me that in a process of evolution, accelerated due to two wars, the manager whom we first outlined could not possibly have dealt with the many legislative burdens that have been imposed upon him, and amalgamations of one kind or another were bound to come. Many people believe that the century of the 'common man' has arrived. Such a statement is, like many, only partially true, for I firmly believe that the day of the specialist is here and that gasworks managers are true specialists with a world of opportunity opening out for them in that they can now transfer to others so many of what were previously problems outside their scope, and confine their activities to running a particular works to its maximum economic limits. By programming the replacement of outmoded plant, by exercising his personal ability on his immediate divisional manager, and by making his works look efficient so that a visit by the board is an event that the members recall. I am certain a works manager could focus a good deal of attention on his plant requirements resulting in their ultimate acquisition.

A board would be ill advised to place any restrictions, on whatever grounds, on the free movement within its area of managers and potential managers. A manager should be given every opportunity of moving from the smaller unit to the larger by reasonable stages. It should not be necessary, apart from rare occasions, for appointments to be made from outside the area for the senior posts nor should a deputy or assistant at a particular unit necessarily move up to the principal position on the then holder retiring or leaving it for other reasons. The most serious obstacle to a full implementation of this suggested policy is housing—a problem of the age—but even that difficulty should not be allowed to stand in the way.

LARGE SCALE DEMAND IN A LIGHT INDUSTRIAL AREA — *Concluded from p. 102.*

given in terms of of percentages, shows relative values of different loads, and in terms of number of maximum hours provides some ideas as to density of demand. Degree of variation is also obtained by this method, again arrived at from quarterly consumptions, nevertheless providing a reliable and fairly accurate guide.

The qualities of the central heating load in the three consumer classes is shown, and the notable development in the domestic sphere illustrated. The quality of demand in the domestic sphere and the degree of variation is considerably different from that of either the commercial or industrial heating loads. The value of the domestic hot water load, which accounts for a considerably greater proportion, is indicated by the relatively high percentage obtained in the September quarter's consistency.

The types of systems encountered in this sphere are examined, and their relative load values are shown in a series of tables, where the value of the hot water load by means of gas fired boilers is very evident.

It was necessary to analyse the commercial heating load to a far greater extent than the domestic heating load, because of the different classes of premises served. Their periods of demand vary over very wide limits, and the load value tables bear out this statement and show the close relationship of churches, and church halls and clubs, which have a considerably lower density of demand compared with the other types of premises.

Industrial heating is confined to a comparison of load values between the conventional low pressure central heating system and the radiant heating system, which has become more and more popular of recent years, and while it has not been the purpose of the paper to put forward claims for either of these systems, it is interesting to note that the density of demand of the radiant heating system is greater than that of the low pressure hot water system, mainly due to the fact that the latter system generally is designed to operate under stricter temperature control.

Relationship between temperature and industrial heating demand is a factor which claims the attention of all industrial gas engineers at some time or another, and their experiences in relating temperature variations with those of consumption in the case of the Welwyn factories may prove of interest and benefit to others, and stresses the need for the relating of temperatures with consumptions taken over identical periods.

Consideration of the commercial load has been confined to three main spheres of use—*viz.*, industrial catering, commercial catering, and fish frying. The consistent relation between industrial catering demand and those of industrial processes is a point worthy of note.

Attention is drawn to a survey of results obtained from eight canteens, and the conclusions which can be drawn in the proportion of personnel employed who obtain their mid-day meal at their place of employment.

The author has endeavoured to draw a comparison between commercial catering and industrial catering, and while there is an entirely different service provided, it is interesting to note that the density of demand and load values are almost identical. The fish frying load could undoubtedly assume greater importance than it does serving the public at the moment under conditions of severe restriction. Nevertheless, the consistency of demand is evident, although the density of that demand is not very considerable. This, it is pointed out, could with removal of restrictions be doubled.

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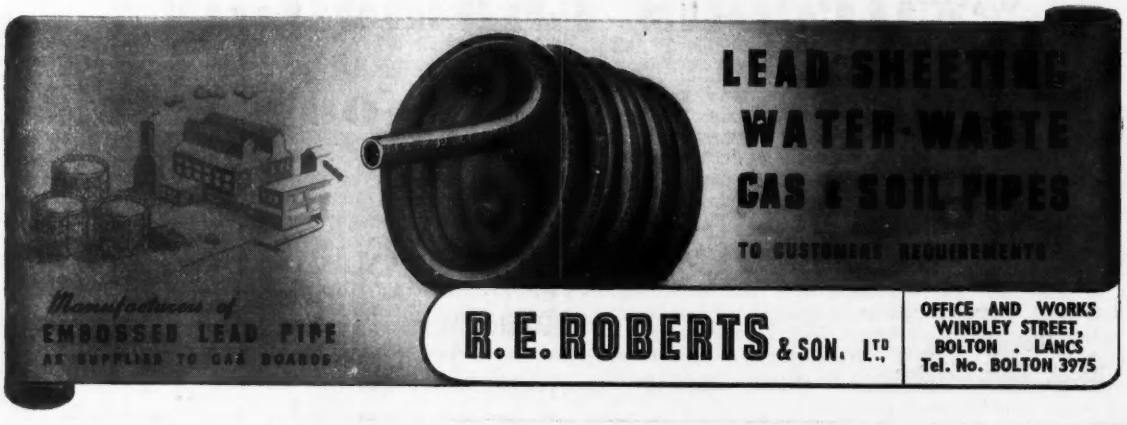

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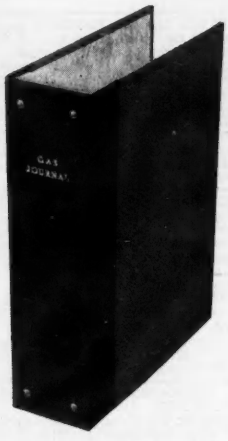

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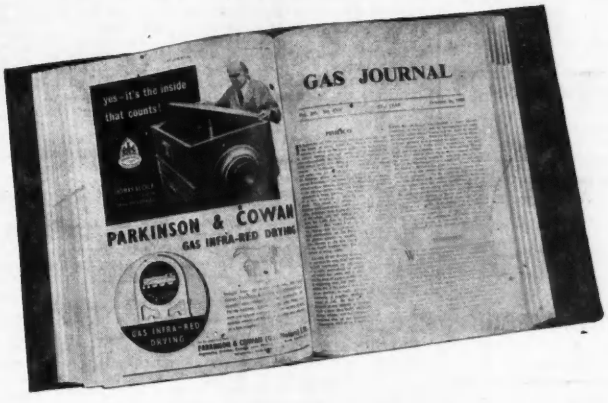

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The "Gas Journal" is published every Wednesday, price 1/3d.; by post 1/5d.

Subscription Rates : Home and Empire :- 52/- per annum ; Foreign :- 60/- per annum. (Both payable in advance.) A copy of the "Gas Journal" Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements : All small classified advertisements are charged at 1/9 per line (approx. 7 words) - minimum charge 10/6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements : Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep x 7" wide; block screen 120.

BUSINESS MANAGER : S. T. CULLEN

MIDLANDS OFFICE : 10, Union Street, Birmingham.

NORTHERN MANAGER : W. Q. Foster, 33, St. Helens Road, Harrogate. 'Phone : Harrogate 84291.

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APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

TWO—COMPETENT GENERAL DRAUGHTSMEN aged 25 upwards required for the Clarence By-Product & Distillation Plant of Messrs. Dorman, Long & Co., Ltd. Applicants should be good, all round men, preferably with experience of the above type of plant.

Also

ONE—JUNIOR DRAUGHTSMAN with a liking for the above type of work.

Permanent employment with good prospects to competent men with initiative. Pension scheme in operation. Apply stating age, experience, wage required, and when at liberty to:—Chief Technical Engineer, Central Engineering Department, Dorman, Long & Co., Ltd., G.P.O.Box No. 11, Royal Exchange, Middlesbrough, Yorks.

GAS ENGINEER FOR DUNEDIN, NEW ZEALAND

THE Council of the City of Dunedin, New Zealand, invites applications for the position of GAS ENGINEER from persons technically qualified and having the training and experience to take full charge of the production, distribution and utilisation of gas and generally to undertake the full management of the Council's gas undertaking.

The schedule of duties and conditions of appointment may be obtained from Messrs. William Coward and Co., Ltd., 3, St. James's Square, London, S.W.1., with whom copies of all applications from the United Kingdom must be lodged by August 7, 1952. Original applications should be forwarded to the undersigned so as to arrive by August 14, 1952.

J. C. LUCAS,
Town Clerk.

Municipal Chambers,
Dunedin, C.1., NEW ZEALAND.
June 16, 1952.

EAST MIDLANDS GAS BOARD
LINCOLN
FOREMEN GAS FITTERS

APPLICATIONS are invited from qualified GAS FITTERS or others having gas fitting and supervisory experience for two vacancies for District Gas Fitting Foremen in Lincoln.

The appointments will be made on Intermediate Grade IV (£435-480). The posts carry generous holidays and sick pay.

Applications stating age, experience and qualifications should be addressed to J. S. Marshall, Belle Vue House, Carline Road, Lincoln, to be received not later than July 16, 1952

BERNARD CLARKE,
Divisional General Manager.

Lincoln.

EAST MIDLANDS GAS BOARD
NOTTS. AND DERBY DIVISION
GANGER MAINLAYER
LONG EATON UNDERTAKING

A vacancy exists for a Ganger Mainlayer capable of taking charge and laying mains and services.

The tenancy of a flat is offered on a Service Tenancy Agreement.

The rate of pay will be 3s. 1½d. per hour with conditions in accordance with the East Midlands Area Joint Industrial Council.

Applications stating age, qualifications and experience should be addressed to the undersigned to be received not later than July 26, 1952.

K. L. PEARCE,
Divisional General Manager.

East Midlands Gas Board,
Notts. & Derby Division,
Friar Gate,
Derby.

SALES REPRESENTATIVE required who has an established connection with maintenance side of gas industry. One already calling who could undertake extra representation would have excellent prospects. First class line. Apply: No. 113, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

SCOTTISH GAS BOARD
DUNDEE GROUP
DUNDEE UNDERTAKING

APPLICATIONS are invited from suitably qualified persons for the following appointments :—

(*a*) MANUFACTURE

(1) SENIOR TECHNICAL ASSISTANT experienced in Maintenance and Development of all Gas Works Plant in District Holder and Governor Stations, Design of Works Layout. Salary Scale :—Grade X (Provincial A) (£645-£745) with placing according to qualifications and experience. Candidates should possess the Higher National Certificate, or appropriate equivalent qualifications of the Institutions of Gas, Civil, Mechanical, and/or Structural Engineers.

(2) TECHNICAL ASSISTANT (CONSTRUCTION) experienced in Layout of Works Plans, Preparation of Drawings, Specifications, Estimates for new Plant. Supervision of erection of new Plant.

Salary Scale :—Grade VII/VIII (Provincial A) (£525-£645) with placing according to qualifications and experience.

Candidates should possess the Higher National Certificate or appropriate equivalent qualifications of the Institutions of Gas, Civil, and/or Structural Engineers.

(3) TECHNICAL ASSISTANT (LABORATORY) experienced in General Laboratory Duties including the testing of Gas, Coal and Spent Oxide and other By-Products of Gas Manufacture.

Salary Scale:—Grade I-VI (Provincial 'A') (£160-£555) with placing according to qualifications and experience. Candidates should possess the Leaving Certificate of the Scottish Education Department or equivalent and the Ordinary National Certificate of the Institutions of Gas and/or Chemical Engineers and/or the Royal Institute of Chemistry or equivalent.

(*b*) DISTRIBUTION

(1) ASSISTANT SUPERINTENDENT (MAINS) experienced in the Laying and Maintenance of Mains and Services, Design of Mains Developments.

Salary Scale:—Grade IX (Provincial 'A') (£595-£695) with placing according to qualifications and experience. Candidates should possess the Higher National Certificate of the Institution of Gas Engineers or an appropriate equivalent qualification.

(2) TECHNICAL ASSISTANT (MAINS) experienced in the preparation of Specifications, Drawings and Estimates for Mains and Services Layouts.

Salary Scale:—Grade VII-VIII (Provincial 'A') (£525-£645) with placing according to qualifications and experience. Candidates should possess certificates as in (*b*) (1) above.

(3) TECHNICAL ASSISTANT (INDUSTRIAL) experienced in the Sale, Fitting and Maintenance of Industrial Appliances, Design of Industrial Installations including Domestic and Commercial Central Heating.

Salary Scale:—Grade VII-VIII (Provincial 'A') (£525-£645) with placing according to qualifications and experience. Candidates should possess certificates as in (*b*) (1) above.

(4) JUNIOR TECHNICAL ASSISTANT (INDUSTRIAL) experienced to lesser degree as (*b*) (3).

Salary Scale:—Grade I-VI (Provincial 'A') (£160-£555) with placing according to qualifications and experience.

Candidates should possess the Leaving Certificate of the Scottish Education Department or equivalent and the Ordinary National Certificate of the Institution of Gas Engineers or the equivalent.

(5) SHOWROOM SUPERVISOR experienced in the Sale of Domestic and Commercial Appliances, Window Dressing, Exhibitions and Demonstrations, control of Showroom Staff.

Salary Scale:—Grade VI(Provincial 'A') (£475-£555).

Candidates should possess certificates as in (*b*) (4) above.

Applications stating age, education, training, qualifications and experience and whether present post is superannuated should reach the undersigned within 14 days of date of publication of this advertisement.

W. S. JOHNSTON,
Group Manager.

Gas Works,
50, East Dock Street,
DUNDEE.
July 4, 1952.

ONE SENIOR DRAUGHTSMAN and One JUNIOR DRAUGHTSMAN preferably with experience on Gas Cooker Design or similar work, £10 14s. 0d. for over twenty-five years of age. A.E.S.D. rates plus for under twenty-five. Write in first instance to Design Department, Thomas De La Rue & Co., Ltd., Portobello Works, Warwick. Engagement through Employment Exchange.

REFRACTORIES TECHNOLOGIST required to act as Deputy to Chief Inspector of Refractory Materials. Qualifications should include a good general knowledge of :— (1) Chemistry and Physics (2) The manufacture and properties of firebricks and silica bricks. Works' experience would be desirable although not essential. (3) Laboratory tests of ceramic materials in general. Apply giving details of age, which should not exceed 35 years, qualifications and experience, together with salary required to: The Personnel Officer, The Woodall-Duckham Co., 63-77, Brompton Rd., London, S.W.3.

A TECHNICAL SALES REPRESENTATIVE is required for the Gasworks Plant Department of Newton Chambers & Co., Ltd., Sheffield. Applicants should be between 30 and 45 years of age and should have suitable qualifications in Gas Engineering. Experience in design and/or manufacture in the gas industry or with a contractor essential.

In addition to a salary there is an efficiency bonus with travelling expenses and the use of a car. The post is superannuated.

Reply to the Personnel Officer, Newton Chambers & Co., Ltd., Thorncliffe, Sheffield, stating details of age, qualifications, experience and salary required.

WEST MIDLANDS GAS BOARD
INDUSTRIAL DEPARTMENT

APPLICATIONS are invited for an appointment on the staff of the Industrial Gas Officer, in Birmingham.

A degree in Science (Eng.) or corporate membership of an engineering institution (Gas, Fuel, and or Mechanicals) is required. Experience in fuel utilisation in industry, including heat transfer equipment would be an advantage.

The salary for the post will be in accordance with Grade X (£645-£745 per annum) of the salary scales of the National Joint Council for Gas Staffs.

The appointment will be subject to such superannuation regulations as the Board may, in due course adopt, and the successful applicant may be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to The Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Birmingham 15, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

PLANT WANTED

WANTED :—REGULAR SCRAP GAS METERS AND PARTS. Best prices paid. Offers to :— Mitcham Smelters Ltd., Red House Road, Croydon, Surrey. *Tel.*: THOrnton Heath 1033, (Private Branch Exchange).

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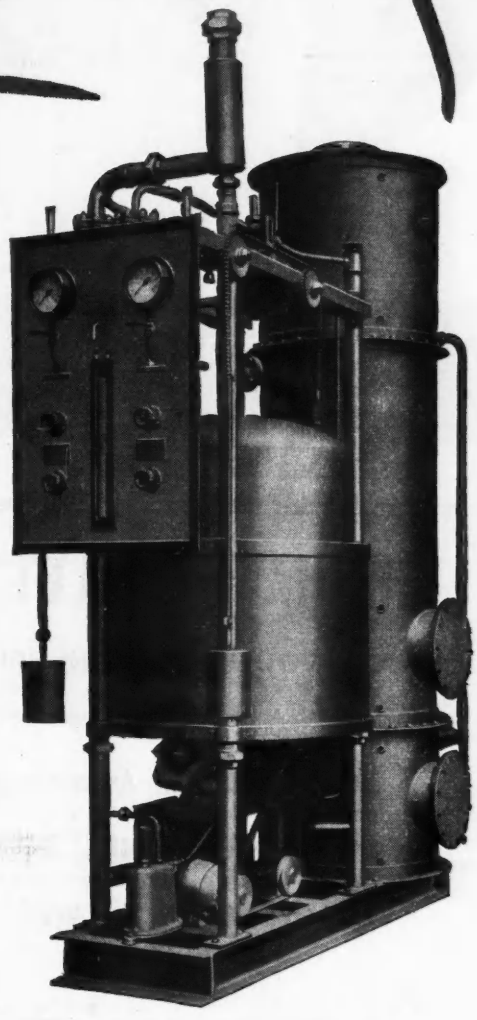

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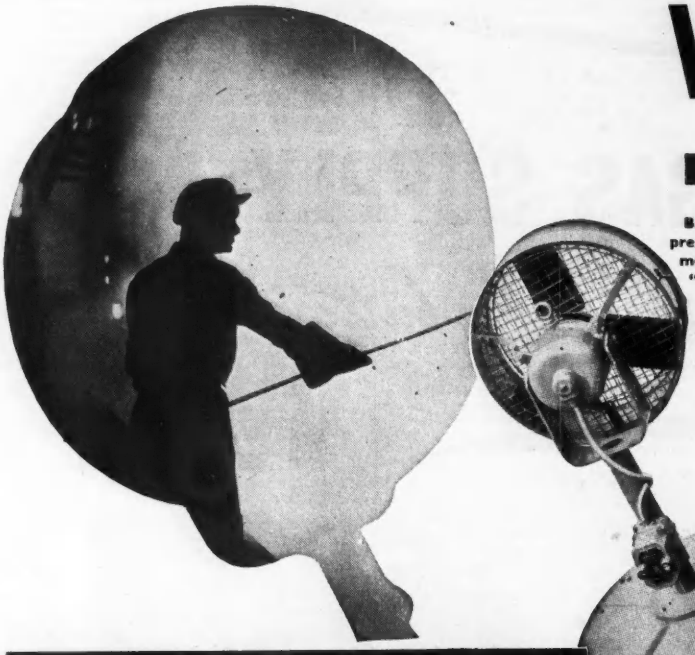

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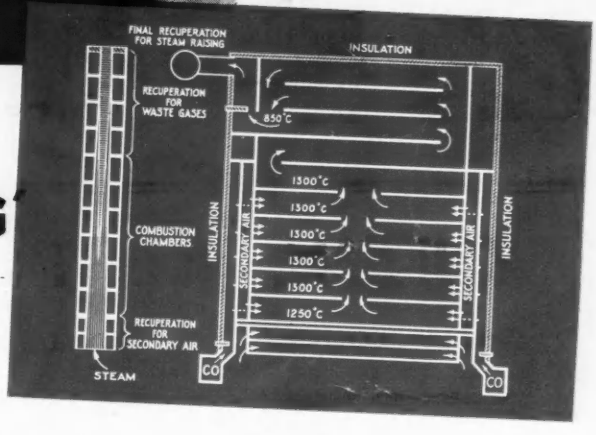

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"Balanced Heating", a feature of the Glover-West continuous vertical system of carbonization, reduces fuel consumption to a level hitherto unobtainable. In the "Balanced Heated" setting, producer gas enters the combustion chambers from *both* sides and retorts are evenly heated by *primary* combustion. Combustion proceeds towards the centre of the setting, heat transmitted to the outer walls being recovered in the producer gas and air uptakes and returned to the system. Control of temperature in individual combustion chambers gives greater flexibility—an important factor today when many different coals are handled by one plant.

★*Illustration shows a "Balanced Heated" setting under construction*

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